

DECEMBER 2018

# Myanmar Dairy Excellence Project (MDEP)

An evaluation of two phases of MFAT's MDEP Investment  
in Myanmar



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## Acknowledgements

This evaluation has been conducted under guidance from and in consultation with MFAT Sustainable Economic Development, Pacific and Development Group. We wish to acknowledge the investment that MFAT has made in setting the direction for and facilitating the work of the evaluation team.

We also wish to acknowledge the considerable time and insights that colleagues from the Government of Myanmar have provided during our field mission, particularly from the Livestock Breeding and Veterinary Department of the Ministry of Agriculture, Livestock and Irrigation.

We have very much appreciated the welcome extended by dairy farmers and the managers and owners of processing companies who we have met. Their responsiveness to our questions and their views on the future of their industry have been invaluable.

We would also like to thank The Agribusiness Group and the MDEP team of advisers for the considerable support, time and effort they gave for our work.

Image: Participants of the August 2018 MDEP Governance Group meeting in Nay Pyi Yaw, Myanmar.

## Table of Contents

<b>Acknowledgements</b> .....	<b>2</b>
<b>Table of Acronyms</b> .....	<b>5</b>
<b>Executive Summary</b> .....	<b>6</b>
<b>1. Background</b> .....	<b>11</b>
<b>2. Evaluation purposes, scope and design</b> .....	<b>13</b>
<b>3. Evaluation Findings</b> .....	<b>14</b>
<b>3.1 Headline Findings</b> .....	<b>14</b>
<b>3.2 Relevance</b> .....	<b>14</b>
3.2.1 The growing milk industry.....	15
3.2.2 Government of Myanmar priorities.....	15
3.2.3 New Zealand’s Aid Programme.....	16
3.2.4 Geographical locations.....	17
<b>3.3 Effectiveness</b> .....	<b>17</b>
3.3.1 Achievement of the goal.....	17
3.3.2 Achievement of Outcomes .....	18
3.3.2.1 Farming and industry practices .....	20
3.3.2.2 Encouraging investments .....	23
3.3.2.3 Milk quality and good management practices .....	24
3.3.2.4 Dairy extension capacity.....	26
3.3.2.5 National Dairy Development Strategy .....	27
3.3.3 Industry approach and partnerships.....	28
3.3.4 Collaboration with other projects.....	30
<b>3.4 Efficiency</b> .....	<b>31</b>
3.4.1 Management and Resourcing .....	31
3.4.1.1 Technical Capability .....	31
3.4.1.2 Staffing .....	31
3.4.1.3 Adaptive Management .....	32
3.4.1.4 Risk Management .....	32
3.4.2 Governance .....	33
3.4.3 Expenditure and value for money.....	33
3.4.3.1 Expenditure and allocations .....	33
3.4.3.2 Funding and resources for industry needs .....	35
3.4.3.3 The Facility Fund.....	35
3.4.3.4 Value for money .....	36
3.4.4 Monitoring and reporting .....	39
3.4.4.1 Monitoring and reporting capacity.....	39
3.4.4.2 Data collection and enhancing the MDEP story .....	40
3.4.5 Comparison of resource efficiency with other dairy projects.....	42
<b>3.5 Sustainability</b> .....	<b>42</b>
3.5.1 Sustainability of MDEP benefits.....	42
3.5.2 MDEP Exit Strategy .....	44
3.5.3 Other sustainability issues .....	45
<b>3.6 A note on likely impact</b> .....	<b>46</b>
<b>3.7 Cross-cutting Issues</b> .....	<b>47</b>
3.7.1 Gender and social inclusion .....	47

3.7.2 Environment .....	48
3.7.3 Human Rights .....	49
<b>4. Evaluation Conclusions .....</b>	<b>50</b>
<b>5. Lessons Learned .....</b>	<b>52</b>
<b>6. Recommendations.....</b>	<b>57</b>
<b>Annex 1: Evaluation analytical framework.....</b>	<b>58</b>
<b>Annex 2: MDEP December 2017 Results Measurement Framework.....</b>	<b>66</b>
<b>Annex 3: Comparison of MDEP’s three results frameworks.....</b>	<b>67</b>
<b>Annex 4: Results Recorded to February 2018.....</b>	<b>70</b>
<b>Annex 5: MDEP Exit Strategy.....</b>	<b>77</b>
<b>Annex 6: Stakeholder groups consulted .....</b>	<b>78</b>
<b>Annex 7: Documents used in this evaluation .....</b>	<b>79</b>

**Tables**

Table 1: Achievements against outcomes .....	18
Table 2: Completion of outputs .....	20
Table 3: Summary of benefits by farm size.....	20
Table 4: Expenditures by output area for MDEP March 2014 to February 2018 .....	34
Table 5: MDEP value for money by cost structure .....	36
Table 6: Trainees in MDEP formal training events.....	37

## Table of Acronyms

<b>Acronym</b>	<b>Meaning</b>
ADD	Activity Design Document
CDVCP	Columbia Dairy Value Chain Project
DAC	OECD Development Assistance Committee
FAO	Food and Agriculture Organization
FMD	Foot and mouth disease
GMP	Good Manufacturing Practice
GoMy	Government of Myanmar
JCFDC	Joint Commitment for Development Cooperation
LBVD	Livestock Breeding and Veterinary Department
LIC	Livestock Improvement Corporation
M&E	Monitoring and evaluation
MDA	Myanmar Dairy Association
MDEP	Myanmar Dairy Excellence Project
MFAT	Ministry of Foreign Affairs and Trade
MITA	Myanmar Industry Training Activity
MLF	Myanmar Livestock Federation
MOA	Memorandum of Agreement
MoALI	Ministry of Agriculture, Livestock and Irrigation
MOFAL	Margin over feed and labour
MSC	Management Services Contractor
NDDB	National Dairy Development Board
NDDP	National Dairy Development Plan
NICHE	Netherlands funded The Netherlands Initiative for Capacity Development in Higher Education
OIE	World Organisation for Animal Health
PIT	Project Implementation Team
PNZDP	Philippines-New Zealand Dairy Project
PwD	People with disability
QCONZ	Quality Consultants New Zealand
SRF	Strategic Results Framework
SPC	Standard Plate Count
TAG	The Agribusiness Group
UHT	Ultra-high temperature processed milk
VfM	Value for money

## Executive Summary

The Myanmar Dairy Excellence Project (MDEP) is a joint commitment by the Government of Myanmar (GoMy) through the Livestock Breeding and Veterinary Department (LBVD) of the Ministry of Agriculture, Livestock and Irrigation (MoALI) and the Government of New Zealand through the Ministry of Foreign Affairs and Trade (MFAT). The project is covered under the Myanmar – New Zealand Joint Commitment for Development Cooperation (JCfDC).

MDEP's goal is:

**“A profitable and competitive Myanmar dairy industry, providing quality livelihoods for farmers, and safe food for consumers”**

MDEP has been delivered over two phases, with Phase 1 commencing in March 2014 and Phase 2 to be completed in February 2019. Total New Zealand expenditure is expected to be approximately NZD 7 million over the five-year period.

MDEP has responded to a dairy industry that in 2014 was showing decline in the sales of traditionally used sweetened condensed milk (SCM) and a need to strengthen the production and quality of fresh locally produced milk and milk products. The project has focused on the key complementary areas of: farming and industry practices on farms and in milk processing; milk quality improvement; capacity development for farmers and service providers; and strategy and planning for government support of the dairy industry.

**MDEP has responded to priorities of the Governments of Myanmar and New Zealand. It has been a logical response to assisting Myanmar to grow its milk industry and has enabled New Zealand to mobilise its recognised international reputation in the sector.**

**MDEP has established sound working relationships with its Government of Myanmar counterparts and has provided a vehicle through which New Zealand can extend its relationships with the Government and deliver on shared development priorities in line with the Joint Commitment for Development Cooperation.**

MDEP has been highly relevant to the needs of Myanmar's growing dairy industry, as milk demand has grown and resources for the industry are increasingly available. MDEP has been relevant to efforts of nucleus farms and processors to increase fresh milk production, raise sales and profits. It is enabling farmers to reduce the cost of producing milk through better forage and farm management and improving the breeding stock of Myanmar dairy cattle.

MDEP fits well within Myanmar's development priorities, particularly in job creation and private sector growth and the country's aims to promote small-scale producers in dairy, better define public and private sector responsibilities in the livestock industry, improve genetics for livestock and improve government management of food safety, animal health and welfare.

MDEP is highly relevant to the New Zealand Aid Programme focus on agriculture as a flagship and to promote market led agriculture. It draws upon New Zealand's position as a world player in dairy and the resources from the dairy industry at home.

Myanmar and New Zealand development priorities have been well aligned through MDEP, which has been in line with and has supported the JCfDC. The project has established a sound working

relationship with its LBVD counterparts and this has been of significant value in extending New Zealand's relationships with the Government of Myanmar.

**MDEP has made significant inroads into developing a previously nascent dairy industry, enhancing its sustainability and improving consumer confidence in locally produced milk.**

MDEP is helping Myanmar to move towards a more sustainable dairy industry and to boost consumer confidence in Myanmar milk and milk products. It has been very effective in instilling farming and industry practice in the participating larger farms and processing operations and has made significant inroads to improve the capacities of the many small farmers with whom it works. It has been effective in encouraging farmers to invest in developing viable and profitable industries, both for larger farms, some of which have been supported through co-investments by the MDEP Facility Fund, and for smaller farms in the investments they are continuing to make in fodder, larger herds and farm infrastructure.

Considerable strides have been made in establishing milk quality systems, with the Government's capacity to test milk strengthened, a growing number of farmers submitting samples for testing and the country's largest retailer now operating a good manufacturing practice system with its suppliers. Quality and hygiene practices are improving, along with consumer confidence, but there are still challenges in establishing and maintaining cold chains, particularly for smaller and more remote farms. The low price of locally produced milk in Myanmar has been and will continue to be a constraint on profitability. However, continued focus on quality is the key to increasing demand and price.

**Since 2014 MDEP has engaged comprehensively with over 300 dairy farms and 40 milk processing operations. It has worked extensively with the industry through the Myanmar Dairy Association and has developed a sound and productive relationship with Citi Mart, Myanmar's largest milk retailer.**

MDEP is on track to help to meet the target of 325 dairy farms increasing milk suppliers to processors. It is working with 40 processor operations and Myanmar's largest supermarket chain, Citi Mart to improve handling and quality and to address cold chain issues. Citi Mart is reporting 24% increases in milk sales (including imports) in the year to July 2018, which presages well for the Myanmar dairy industry. 75% of the milk samples submitted to the project supported LBVD testing facilities are meeting quality requirements (but less for yoghurt). The project has an excellent relationship with the Myanmar Dairy Association, which plays a leading role in mobilising milk producers and processors.

The nucleus and focus farm model promoted by MDEP, which sees larger farms acting as hubs and training/learning centres for smaller farms, has been effective and has engendered strong multi-layered partnerships between focus and nucleus farmers, farmers and processors and between processors and retailers. MDEP works with 7 nucleus farms and has provided management advice to a total of 291 farms., an increase from 161 in February 2017. It has closely monitored a total of 83 farms, including nucleus farms. Just under 800 farms in total have received some form of support through MDEP and its counterparts. Almost 300 farms have responded to MDEP's message to grow their own pasture. Over 500 farmers have received and benefitted from New Zealand semen straws and are now learning to care for the new genetics.

Nucleus farms and processors are adapting to and adopting new technologies and have received Facility Fund support to purchase strategic equipment. They have benefited from MDEP shed designs and the full range of on-farm improvements extended by the project. They are able to

continue to invest and benefit. Progress has been slower for the smaller farmers because of their large number, the generally low prices they receive for their milk and the incremental progress than can be made in better practices. Their capacity to invest is limited. A refinement is being trialled in the form of a small milk collection centre to be operated by a farmer group in an area where taking milk to existing processors is time consuming and where the cold chain is currently impossible. This should raise milk prices paid to the farmers and shows promise for the future but will not be operational by the completion of Phase 2.

**On farm investments have been particularly effective in improving dairy farm management and are making inroads on farm profitability. Estimates for monitored farms are that returns from MDEP investment in terms of margin over feed and labour are approximately NZD 730,000 per year. More comprehensive data would add significantly to this picture.**

MDEP investments in dairy farming systems and milk quality improvement have been good value for money (VfM). There is sufficient data for confidence that MDEP is helping farmers to make financial gains. MDEP estimates for a sample of 83 farms that the average margin over feed and labour (MOFAL) per month increased from NZD 1,041 at the start of each farm's involvement with MDEP, to NZD 1,774 at the end of March 2018. We suggest that aggregating this data over the 83 farms covered by this data would indicate a return from the MDEP farm level investment of about NZD 730,000 over a period of a year. We have not been able to fully verify these figures, but accept them as a reasonable estimate. If MOFAL results could be aggregated over a longer period of time and include more farms, this figure would be significantly higher. There are also indications that the MDEP strategy has encouraged significant investment in the industry, totaling about NZD 4.5 million by four major farms alone.

Collection of industry level aggregate data on a more systematic basis would significantly assist a line of sight between MFAT investments and results on the ground. This needs to be founded on solid monitoring and evaluation arrangements. For much of the MDEP period, monitoring and reporting for MDEP was hampered by a lack of clarity around outcomes, evidence-based assessments and the lack of a comprehensive baseline survey. Outcome clarity has improved in the last year, particularly after the revised results framework was approved in December 2017. The systematic collection of data on increased investments and sales would have been useful to augment the project's capacity to assess achievement of industry outcomes and in turn inform industry development. A market systems analysis would have added to this, including gaining a better understanding of milk consumers and their preferences.

Two constraints to the industry's development that MDEP has not been resourced to deal with and has not attempted to address are; access to finance and land. These are complex issues, which cannot be addressed through a sector-oriented activity like MDEP. Into the future however, it would be useful to explore these constraints and opportunities.

**Investments in supporting a government led extension service and the development of a national dairy strategy have not been effective.**

While LBVD has provided counterparts for MDEP to the extent it has been able, this has not resulted in the development of a sustainable capacity for dairy extension. This has meant that dairy extension has largely been the responsibility of New Zealand advisers and a small number of Myanmar advisers from LBVD. The expertise of MDEP people (from Myanmar and New Zealand) has been appropriate and well received. Clearly, with the difficulties around establishing extension capacity, the project would have benefitted from more people from Myanmar and New Zealand working on the ground.



The needs of the dairy industry have grown significantly over the last four and a half years and this has left MDEP personnel stretched in terms of time allocation and logistics.

MoALI has recognised the need to redefine its role from that of delivering extension services to become the overall facilitator of extension services that are more aligned to the needs of industry and involve industry in their delivery. Despite technical support from MDEP, LBVD has not yet delivered the National Dairy Development Strategy. For ongoing support to be warranted, the GoMy must first demonstrate that this is a priority and that resources are available to take a strategy forward.

**MDEP efforts have not been supported by a gendered analysis of the dairy value chain and as a result have been largely gender neutral and there is no evidence of significant outcomes specifically for women.**

The MDEP design anticipated strategies to ensure that gender and social inclusion were mainstreamed including a full gender analysis and the integration of information relating to the roles of women and young people on dairy farms within the farm baseline surveys. Neither were undertaken. Project implementation has largely been undertaken in the absence of a gender lens and it is hard to see exactly how mainstreaming has been undertaken and evidence what the outcomes have been for women. More recently, MDEP has taken steps to strengthen gendered approaches to training through women's discussion groups in farming villages but this is not programme wide. No specific efforts have been undertaken to address the needs of other segments of the community and/or vulnerable groups such as young people and people with disability.

MDEP is helping to put environmental safeguards in place in the dairy industry through work on effluent management and recommending less use of concentrate in cattle feed, which is known to reduce methane. It has undertaken some initial capacity building work with the Food and Drug Administration on laboratory staff capacity in micro-chemistry testing of agricultural residues.

**In a relatively short time, MDEP has successfully supported the emergence of the dairy industry in Myanmar, however it is early days and the industry is still emerging. Given the significant room for growth and opportunity within the sector, further ongoing engagement in the sector over the medium to long term has the potential to deliver significant results.**

Local ownership of MDEP benefits has been good, benefits are becoming sustainable but further support is needed to consolidate. MDEP is contributing to the creation of a viable and sustainable industry with industry players increasingly grasping opportunities for improvement. A common understanding by industry and the Government of how to grow the industry is emerging, based around sound production and quality principles. Farmers have increased their appetite for investment risk. MDEP demonstrates that farm and forage management have been improved significantly. The nucleus/focus farm approach is logical, is working well and is engendering a sense of common ownership among those participating. However, all of these benefits need further support if they are to be sustained and more players are to be drawn into the industry. The extension system for dairy is not embedded or sustainably resourced and remains a significant future challenge. The impressive gains in milk quality brought about by MDEP and its partners will also require more support, including the adoption of a national milk standard and more comprehensive testing by nucleus farms and processors, which could lead to government testing being elevated to a system of audit and inspection.

The sustainable supply of agricultural supplies and equipment for the Myanmar dairy industry is an ongoing challenge. The MDEP Facility Fund has encouraged investment by larger industry players

but is not sustainable and in the future should be reduced and/or phased out. Sustainability of servicing and maintenance of farm equipment is also a concern. The dairy industry is dependent on importing and will remain so for the foreseeable future. MDEP has provided supplies of seed and semen free of charge. This has been justified by the need to convince farmers to adopt new and improved genetics but is also not sustainable. Farmers, particularly at the smaller end of the industry, will need to be persuaded to pay for these inputs.

With these findings in mind, the evaluation's major recommendation is:

**New Zealand support to the dairy industry in Myanmar should continue beyond February 2019 and for continuity reasons should be scheduled to start as soon as possible after MDEP Phase 2 is completed.**

We recommend that a future New Zealand investment in Myanmar's dairy industry should:

- Ensure that a market systems analysis is included in the design;
- Consider fresh approaches to creating a dairy extension service;
- Clarify with the Government of Myanmar that a dairy development strategy is a priority and that there are resources available to take it forward;
- Consider engaging a wider range of government agencies in supporting dairy development;
- Consider reducing and/or phasing co-investment out, while seeking to support further investment in other ways;
- Utilise a programme logic / theory of change approach;
- Specify clear baseline and monitoring requirements and ensure that adequate budget is provided for these;
- Ensure a thorough analysis of gender and social inclusion aspects is included and clearly demonstrate how such priorities will be addressed, measured and funded; and
- Consider alternative approaches to technical assistance and contingencies in design to allow scale up of technical assistance as the industry grows.

## 1. Background

At the time of the design for Phase 1 of the Myanmar Dairy Excellence Project, the Myanmar dairy industry was centred around the production of sweetened condensed milk, which was in decline, and was dependent on the milk of local, primarily draught animals. The largest markets were in Yangon and Mandalay. The logistics of milk collection and maintenance of milk quality from farm to processing facility was problematic. Hence almost all milk was processed into condensed form. There was an increasing recognition of the need for milk quality and new processing facilities. The Myanmar Government was keen to develop the industry and to increase the production and consumption of fresh milk and milk products. A National Dairy Development Board (NDDB) had been established.

At the time, imports of milk products were increasing. Domestic milk production per cow was low. There were no systems for hygiene and milk quality. Investments in the industry were also very low, with little interest from foreign investors. The national dairy herd was estimated at around 600,000, but only 100,000 were from recognised dairy breeds. The majority of milk was produced by smallholder farms with herds of less than 5 cows, who earned around NZD 0.5 per day. The potential for dairying to contribute to rural livelihoods and to better nutrition of Myanmar citizens was recognised by the Government.

The Myanmar Dairy Excellence Project was designed to respond to these challenges. MDEP is a joint commitment by the Government of Myanmar (GoMy) through the Livestock Breeding and Veterinary Department (LBVD) of MoALI and the Government of New Zealand through the Ministry of Foreign Affairs and Trade (MFAT). MDEP recognises Myanmar's need and desire to grow its dairy industry, provide sustainable livelihoods, particularly for its rural population and promote milk as a nutritious food. MDEP aligns within the New Zealand aid programme aim to help enable agriculture to drive economic growth and is an MFAT flagship activity in Myanmar. MFAT's investment in MDEP is approximately NZD 7 million over five-years, 2014 - 2019.

MDEP has been implemented by a Management Services Contractor (MSC), The Agribusiness Group (TAG). MDEP is based in Mandalay with activities in Mandalay, Yangon and Sagaing Regions, Shan State and Nay Pyi Taw Union Territory. The first phase of MDEP commenced in March 2014, the second in March 2016, which is due for completion in February 2019.

MDEP's goal is:

**“A profitable and competitive Myanmar dairy industry, providing quality livelihoods for farmers, and safe food for consumers”**

Over the four and a half years of implementation, MDEP has focused on the key complementary areas of<sup>1</sup>:

- Farming and industry practices on farms and in milk processing;
- Milk quality improvement;
- Capacity development for farmers and service providers; and
- Strategy and planning for government support of the dairy industry.

MDEP works with the industry at all stages in the milk value chain; production of fodder, production of raw milk, aggregation and processing of product and retailing to the consumer. MDEP's work with

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<sup>1</sup> Throughout the two phases of MDEP, there have been three iterations of the results framework. Annex 2 shows the latest Results Measurement Framework, approved in December 2017. Annex 3 provides a tabular comparison of these.

input suppliers is largely through nucleus farms that connect to smaller focus farms of varying sizes to collect and aggregate milk, and to improve farming practices. MDEP supports improved genetics in Myanmar's dairy herds through the provision of New Zealand semen as well as on animal health and welfare. It also works with government and industry on milk quality improvement. MDEP has a Facility Fund, in which New Zealand funds are used on a co-investment basis to encourage larger industry players to invest in essential technology through sharing risk.

## 2. Evaluation purposes, scope and design

**Purposes:** With Phase 2 of MDEP coming to its conclusion, MFAT has commissioned this independent evaluation to:

- Assess the relevance, effectiveness, efficiency, sustainability and impact of MDEP from March 2014 to February 2018;
- Identify lessons learned for supporting dairy development in Myanmar in the future; and
- Inform policy and practice to contribute to the broader evidence base on dairy development within and beyond the New Zealand Aid Programme.

**Scope:** The team has evaluated MDEP results over both phases from March 2014 to February 2018. The Evaluation is both retrospective and forward looking. This report assesses MDEP's achievements against its intended results from a retrospective viewpoint. As MFAT is currently considering the future of its assistance for Myanmar's dairy industry, a complementary document has been produced by the evaluation team which provides a forward-looking assessment of MFAT options for supporting the industry.

**Evaluation Design & Methods:** The evaluation was designed around the above purposes and scope and is informed by the OECD Development Assistance Committee's (DAC) criteria. A three-week evaluation mission was conducted in August 2018.

The evaluation used mixed methods for information collection, combining quantitative and qualitative data including document review (see Annex 7), stakeholder analysis, field observations, key informant interviews and focus group discussions (see Annex 6 for a list of consultations). Specifically, the team developed an analytical framework as the basis for assessment and collection of evidence against evaluation criteria. The framework included detailed lines of enquiry aligned with each stakeholder groups to guide field discussions and observations (see Annex 1). Using a participatory assets and strengths-based approach, the evaluation sought to build upon the existing knowledge and collaborative working relationship between MFAT, TAG, LBVD and their partners. Gender and socially inclusive approaches were incorporated into the evaluation design, which also explored MDEP's attention to cross cutting issues.

### 3. Evaluation Findings

#### 3.1 Headline Findings

This evaluation has found that:

- MDEP has responded to priorities of the Governments of Myanmar and New Zealand. It has been a logical response to assisting Myanmar to grow its milk industry and has enabled New Zealand to mobilise its recognised international reputation in the sector.
- MDEP has established sound working relationships with its Government of Myanmar counterparts and has provided a vehicle through which New Zealand can extend its relationships with the Government and deliver on shared development priorities in line with the Joint Commitment for Development Cooperation (JCfDC).
- MDEP has made significant inroads into developing a previously nascent dairy industry, enhancing its sustainability and improving consumer confidence in locally produced milk.
- Since 2014 MDEP has engaged comprehensively with over 300 dairy farms and 40 milk processing operations. It has worked extensively with the industry through the Myanmar Dairy Association and has developed a sound and productive relationship with Citi Mart, Myanmar's largest milk retailer.
- On farm investments have been particularly effective in improving dairy farm management and are making inroads on farm profitability. Estimates for monitored farms are that returns from MDEP investment in terms of margin over feed and labour are approximately NZD 730,000 per year. More comprehensive data would add significantly to this picture.
- Investments in supporting a government led extension service and the development of a national dairy strategy have not been effective.
- MDEP efforts have not been supported by a gendered analysis of the dairy value chain and as a result have been largely gender neutral and there is no evidence of significant outcomes specifically for women.
- In a relatively short time, MDEP has successfully supported the emergence of the dairy industry in Myanmar, however it is early days and the industry is still emerging. Given the significant room for growth and opportunity within the sector, further ongoing engagement in the sector over the medium to long term has the potential to deliver significant results.

The following findings respond to the Analytical Framework (see Annex 1) and illustrate headline findings.

#### 3.2 Relevance

The choice of a dairy project by New Zealand and Myanmar has proven to have been well placed and relevant for both countries<sup>2</sup>. From the Myanmar perspective, dairy is an industry with a future, which contributes to the country's economic, rural and nutritional objectives. From the perspective of the New Zealand Aid Programme, MDEP is a good example of "strengthening the value of our aid

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<sup>2</sup> Other options considered at the time included small ruminants and crops.

by doing what we do well”<sup>3</sup>. The 2017 – 2021 JCfDC clearly places MDEP as a flagship for cooperation.

MDEP has focused its efforts around profitable and productive dairy systems, the improvement of milk quality, the development of a network of dairy extension officers, and the development of the National Dairy Development Plan (NDDP). This was a logical response to the needs of the nascent dairy industry to increase production and profitability and meet the growing demand for milk and milk products, thus enhancing industry sustainability and consumer confidence, as expressed in the project’s long-term outcomes. Implementation experience has shown that industry has responded well to working on dairy systems and milk quality. MDEP was also a logical response to encouraging government support for the growing industry, to oversee the creation of a dairy extension service and develop a dairy strategy.

MDEP has established sound working relationships with its Government of Myanmar counterparts and has provided a vehicle through which New Zealand can extend its relationships with the Government and deliver on shared development priorities in line with the Joint Commitment for Development Cooperation (JCfDC).

### 3.2.1 The growing milk industry

#### **MDEP is highly relevant to Myanmar’s growing dairy industry**

There is a growing demand for milk in Myanmar, and resources for the industry are increasingly available, however the industry still requires technical support to increase production and raise milk quality.

MDEP has been highly relevant to efforts of nucleus farms and processors to increase fresh milk production, raise sales and profits. Nucleus farms and processors are also working with the project and LBVD to improve milk quality, a key issue for retailers and consumers. MDEP has been able to develop a solid relationship with the Myanmar Dairy Association (MDA), which plays a leading role in mobilising milk producers and processors and supports the mandate and the activities of MDA.

MDEP is enabling farmers to reduce the cost of producing milk through better forage and farm management. Growth in milk production per cow per day is increasing. Focus farms are benefiting as they gain skills and capacity in small-scale milk herd management, including raising milk quantity. MDEP works with a large number of smallholder dairy farmers, most of whom only have a few dairy animals.

MDEP relevance to input suppliers is growing. There are still challenges to face in the future to convince input suppliers that a sufficiently large market exists to warrant investment in sales infrastructure. Progress is being made in the supply of seed. By contrast the supply of agricultural machinery (and repair and supply of spare parts) is still a challenge.

Demand for milk is growing rapidly, with major supermarket chain, Citi Mart, reporting a 24% increase in monthly sales over the year to July 2018. MDEP’s work to raise the quantity and quality available to the consumer is very relevant.

### 3.2.2 Government of Myanmar priorities

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<sup>3</sup> New Zealand Aid Programme Strategic Plan, 2015 -2019

### **MDEP is relevant to Myanmar's development priorities**

MDEP is relevant to the Prosperity and Partnership Pillar of Myanmar's Sustainable Development Plan (2018 – 2030)<sup>4</sup>, which includes the goals of job creation and private sector growth. The Plan envisages an enabling environment for agriculture to help reduce poverty in rural areas; creation of employment, especially through small and medium sized enterprises; and an enabling environment for boosting investment and investor confidence. MDEP contributes to each of these by: raising rural incomes through support for small dairy focus farms; the development and expansion of small to medium sized nucleus farms and processor operations; and making the dairy industry more attractive to investors. It is also relevant to the GoMy strategy under Pillar 3: People and Planet, "to increase secure access to food that is safe and well-balanced".

MDEP is also relevant to aims within the recently released Agriculture Development Strategy & Investment Plan for 2018-19 to 2022-23 to improve rural livelihoods in agriculture, promote small-scale producers in dairy, better define public and private sector responsibilities in the livestock industry, improve genetics for livestock and improve government management of food safety, animal health and welfare. MDEP is in a good position to respond to most of these development priorities, although it has been less responsive to the need to better define public and private sector roles in dairy extension. LBVD has confirmed MDEP's relevance to its role in increasing dairy production and in meeting Myanmar's nutrition and food requirements. MDEP has been enthusiastically welcomed by LBVD for its work in animal production, health and welfare, the increased production of milk and the focus on milk quality.

#### 3.2.3 New Zealand's Aid Programme

### **MDEP is highly relevant to MFAT's programme for Myanmar and for New Zealand's overall overseas assistance programme**

MDEP fits well within New Zealand's focus on agriculture as a flagship priority for its Aid Programme which aims to "to promote market-led agriculture by strengthening value chains, improve market access through better biosecurity and food safety systems, and build resilience and tackle food security and nutritional challenges". The MDEP goal aligns the project very closely to MFAT strategic aims for agriculture. Dairy is a key sector within this and MDEP is a logical and relevant part of this<sup>5</sup>.

New Zealand is ranked as the world's largest exporter of dairy, and the eighth largest milk producer<sup>6</sup>. Specifically, New Zealand's dairy industry is known for its world class milk and milk product safety and biosecurity systems, as well as research, training and education facilities able to respond to the needs of the industry. MDEP, as it encourages milk production, quality, food safety and consumption, can draw upon significant resources from the dairy industry at home.

MDEP is relevant to the Sustainable Development Goals, particularly to end poverty, hunger and malnutrition, to promote decent work and economic growth and to promote investment in industry and innovation.

Myanmar and New Zealand development priorities have been well aligned through MDEP, which has been in line with and supported the JcFDC. The project has established a sound working relationship

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<sup>4</sup> Sourced from: [http://themimu.info/sites/themimu.info/files/documents/Core\\_Doc\\_Myanmar\\_Sustainable\\_Development\\_Plan\\_2018\\_-\\_2030\\_Aug2018.pdf](http://themimu.info/sites/themimu.info/files/documents/Core_Doc_Myanmar_Sustainable_Development_Plan_2018_-_2030_Aug2018.pdf)

<sup>5</sup> MFAT also currently supports dairy development in Indonesia, the Philippines and Columbia.

<sup>6</sup> [www.dairynz.co.nz/media/5788611/quickstats\\_new\\_zealand\\_web\\_2017.pdf](http://www.dairynz.co.nz/media/5788611/quickstats_new_zealand_web_2017.pdf)



with its LBVD counterparts and this has been of significant value in extending New Zealand's relationships with the Government of Myanmar.

### 3.2.4 Geographical locations

#### **MDEP geographical locations are relevant to the distribution of the dairy industry.**

The Phase 1 design recommended that MDEP start by supporting the Mandalay and Yangon regions because of their wholesale milk markets. By the end of Phase 1, and largely due to increased advisor staffing, MDEP operations expanded to include Nay Pyi Taw, which has a growing market for milk and into North and South Shan, where despite logistical challenges<sup>7</sup> to supply the major urban markets, the climate is well suited to dairy production. The inclusion of the parts of Sagaing Region close to Mandalay is a logical geographical extension, given that milk is sold from there to Mandalay.

### 3.3 Effectiveness

#### 3.3.1 Achievement of the goal

#### **MDEP is helping Myanmar to move towards a more sustainable dairy industry and to boost consumer confidence in Myanmar milk and milk products**

With the goal of "A profitable and competitive Myanmar dairy industry, providing quality livelihoods for farmers, and safe food for consumers", MDEP has made significant inroads into enhancing the sustainability of Myanmar's dairy industry and to improving consumer confidence in locally produced milk. MDEP demonstrates that investments in the industry are increasing (notably in the processors and nucleus farms) and that farmers increasingly see dairy as a viable and profitable industry. They are adopting to various degrees and in various ways profitable and productive dairy farming systems through MDEP's work. MDEP has continued to attract more farmers. From February 2017 to February 2018 the number of focus farms increased from 161 to 282, at which time 798 dairy farms were reported as receiving some form of support through MDEP and its counterparts. Of these, almost 300 farms were reported to be growing pasture and 520 farms to be using New Zealand semen. MDEP has closely monitored a total of 83 farms, including nucleus farms and records of 862 individual farmers.

MDEP reports that the gross margin over feed and labour is increasing i.e. that making improvements in dairy production can be profitable (please refer to more detail in Section 3.4.3.4). On the basis of margin improvements, MDEP is contributing towards livelihoods for farmers. Owners and managers of larger farms appear to be benefitting a lot from MDEP support. The extent to which this constitutes quality livelihood is uncertain for poorer farming families, especially as the notion of a quality livelihood has not been reflected in the results measurement table and MDEP has not significantly addressed gender and social inclusion issues.

MDEP has helped to make significant inroads into improved milk quality. A good manufacturing practice (GMP) system for milk has been introduced and is gaining traction. Milk of higher quality is now being accepted for processing and retailing, showing that progress is being made on providing safe food for consumers.

A major constraint on profitability is the low price of locally produced fresh milk in Myanmar, which is not helped by cheap imports of powdered milk. Production costs are generally high and margins for farmers relatively slim. For small farmers, this is not helped by their reliance on village milk

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<sup>7</sup> New Zealand security restrictions on travel to Northern Shan have since been put into place. The LBVD Coordinator for MDEP, based in Nay Pyi Taw, has covered Northern Shan.

collectors who undertake the milking and take milk to collection and processing centres and who pay relatively low prices. The MDEP team holds the view that Myanmar dairy farmers cannot compete in the market against imported products, except for fresh milk, and that there should not be an expectation that local milk prices will rise. We suggest, however, that if demand for fresh milk does rise helped by quality improvements, better farm practices will result in lower production costs and if complemented by more efficient transport to processors, profitability will increase. A tipping point can be expected when consumer demand reaches sufficient momentum to stimulate significantly more demand and investment across the industry. MDEP has rightly stated that milk and milk product quality is the key to increasing demand.

### 3.3.2 Achievement of Outcomes

MDEP has two long-term outcome indicators.

The indicator “Number of new dairy farms in Myanmar (locally and internationally funded) that are increasing the contribution to milk delivered to processors” is used to assess progress in moving towards the outcome of “enhanced sustainability of the Myanmar dairy sector”. MDEP measures this by the number of farms it is working with that have herd sizes of one to 50 cows, 50 to 100 cows and over 100 cows. MDEP reports that the target of 300 small farms by February 2019 was almost attained a year in advance - a major achievement. The targets for medium and large farms are 15 and 10 respectively, with February 2018 attainments of five farms in each category. MDEP is likely to meet the target for medium sized farms and will be close to reaching the target for large farms.

The indicator “Percentage growth in sales of local fresh milk and milk products per annum through approved supplier schemes” is used to assess the outcome “increased consumer confidence in Myanmar milk and milk products”. Although a detailed baseline has not been established, it is clear from observations that MDEP partner Citi Mart is enjoying considerable growth in milk sales and is reporting significant reductions in consumer complaints about milk. MDEP has helped significantly in this and deserves credit.

Annex 4 provides an assessment of MDEP results against agreed targets at the outcome level in line with the December 2017 Results Framework and is based on MDEP’s May 2018 Annual Report and evaluation discussions. The Annex is summarised in Table 1.

Table 1: Achievements against outcomes

Outcomes	Target	Likelihood of target achievement by February 2019
<b>Long-term outcomes</b>		
Enhanced Sustainability of Myanmar Dairy Sector	300, 15 and 10 small, medium and large new dairy farms in Myanmar (locally and internationally funded) that are increasing the contribution to milk delivered to processors	On track to meet 300 small farms target. Likely to achieve target for medium sized farms and be close to that for large farms.
Increased Consumer Confidence in Myanmar Milk & Milk Products	10% growth in sales of local fresh milk and milk products per annum through approved supplier schemes	Citi Mart reports 24% growth in the last year, although this includes imported milk.
<b>Medium-term outcomes</b>		
Increased Investment in Dairy Production and Processing	80% of Nucleus and Focus Farmers who have invested in at least two of: increased fodder establishment, increased size of herds, farm infrastructure, and processing capacity	33% achieved by early 2018. Could meet 80% by February 2019.
Dairy Farming as a Viable and Profitable Business	Percentage of dairy farms having annual income that exceeds annual	90% target for February 2018 likely to be achieved.

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

Outcomes	Target	Likelihood of target achievement by February 2019
	feed and labour costs (i.e. positive gross margin)	
Milk and Processed Milk Products Meeting Quality Standards	1) 75% of fresh milk products from nucleus supply processors consistently meeting approved milk quality standards  2) 10 days shelf life of Myanmar milk products accepted at City Mart Holdings	1) Target of 75% reached already for milk but may not be reached for yoghurt.  2) Citi Mart, which has been cautious to date, may allow increased shelf life by February 2019 but this is not guaranteed. Currently remains at 4 days.
<b>Short-term outcomes</b>		
Implementation by Myanmar dairy industry of National Dairy Development Plan	National Dairy Development Plan for Myanmar in place and implemented	Process stalled within GoMy. Will not be achieved.
Profitable and productive dairy farming systems implemented by farmers	1) 60% of dairy farms actively implementing at least six 'best practices' that have been demonstrated to them in extension activities  2) 4 farmers adopting improved effluent management systems  3) Milk yield of 12 litres/cow/day	1) 25% achieved by February 2018. May achieve the 2019 target.  2) 3 farms currently implementing. Very likely to achieve 4 by February 2019.  3) Currently about 9.3. litres/day. Will not achieve 12 litres by end of Phase 2 but some further progress is likely.
National network of competent dairy advisers	15 project-certified dairy advisers in LBVD and 10 from the private sector.	18 LBVD officers trained and 1 person from private sector. However, LBVD has resource constraints and only 3 LBVD officers are full-time dairy advisers. This falls short of a national dairy extension service.
Good manufacturing processes adopted	1) 60% of nucleus farm processors complying with good manufacturing processes  2) 60% of GMP nucleus processors with in-house laboratories	1) Progress being made with 3 processors with Citi Mart GMP certification. Target of 60% implies 12 with such certification. Cannot comment definitively as certification audits will happen late 2018 but target achievement is likely.  2) Achievement likely subject to successful audits.
High quality raw milk accepted for processing	50% of milk delivered to collection centres from project supplier farms meeting approved milk quality standards	Over 50% of milk submitted for testing is meeting standard plate count requirements. However, the total quantity of milk reaching collection centres meeting standards is not known.

MDEP has also reported against the output level in its latest annual report and a summary of this is provided in Table 2, which includes notes on progress and the extent to which the Evaluation team has been able to verify information.

## MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

Table 2: Completion of outputs

Output	Target	Progress
Processes Established to Support Adoption of National Dairy Development Plan	Preparation of draft NDDP supported by MDEP & 10 NDDB board and secretariat members trained to manage implementation of the NDDP	Draft recommendations with LBVD. The Board has not functioned, and training has not been delivered. (Verified through discussion)
Programme of Support for Best Farm Practices for Dairy Farmers Implemented	250 focus farms; 30 discussion groups (5 for women) with 750 participants (30% women); 5000 farmers engaging with Greenovator App; 2400 farmers attending 24 field days/demonstrations, 500 farms demonstrating forage and animal raising improvements.	MDEP reports it has involved 282 focus farms, 12 discussion groups (2 for women), with about 200 participants (female total not reported); Greenovator only just launched and number of dairy farmers subscribing not yet known; number of field days and participants not reported; MDEP reports that it has reached out to 798 farmers on a range of topics but the data presented is not clear as to the total number demonstrating both forage and animal raising improvements.
Capacity Development Programme for Dairy Farmers and Extension Officers Designed and Delivered	12 training modules completed & available; modules available on-line; 12 LBVD and 10 private sector trainers trained; 100 LBVD officers trained as dairy extension officers.	Although we have seen a sample of training course outlines and topics, the number of completed modules is unknown and detailed materials have not been provided to the evaluation team. Sample of MDEP internet videos seen on line. 23 extension trainers trained, but number practising not included as an indicator. 85-90 officers trained in dairy extension.
Milk Quality Improvement Practices Implemented through the Value Chain	National laboratory service for milk testing established and using standard operating procedures; 60% of processors audited as compliant; 10 retail staff and 18 processor staff trained in milk quality and handling; pilot village milk collection centre established; Citi Mart approved supplier scheme in place.	The laboratory service is functioning, verified through visit. Processor audit still pending. 31 processors with staff trained (MDEP report). Tapel village milk collection centre was not functioning in our visit in August 2018 and was awaiting a suitable milk buyer and negotiation of an agreement with MDEP. Citi Mart confirmed in discussion that training for its staff has occurred and that it has an approved supplier scheme (GMP) in place.

### 3.3.2.1 Farming and industry practices

**MDEP has been very effective in instilling farming and industry practices on farms and in processing. Farmer capacities have been enhanced.**

Over its two phases, MDEP has been able to significantly enhance the use of farming and industry practices and thus the capacities of farmers to operate more successfully in the milk industry. The following table provides as a summary, our comparison from observations of selected benefits that have been received by nucleus and larger and smaller focus farms.

Table 3: Summary of benefits by farm size

Area of benefit	Nucleus farms	Larger focus farms	Smaller focus farms
Equipment support	Subsidised equipment	Some equipment support	Very little equipment

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

Area of benefit	Nucleus farms	Larger focus farms	Smaller focus farms
	through Facility Fund co-investment	but variable	support
Technology adoption	Able to easily adapt to and adopt new technologies, and make quite large investments	Can adapt to and adopt new technologies but capacity to invest is limited	Can adapt to and adopt new technologies but capacity to invest very limited (access to finance is difficult)
Farm construction/design	Benefitting from MDEP advice on farm construction/shed design – able to invest	Some benefitting from farm construction/shed design but investments are modest	Can benefit from this but require local and cheap materials. Progress more difficult.
Fodder and feeding	Have benefitted from advice on fodder and provision of free seed	Have benefitted from advice on fodder and provision of free seed	Have benefitted from advice on fodder and provision of free seed (however, may not be able to afford to buy seed)
Farm profits	Gains being made - in some cases likely to be significant	Gains being made	Gains being made
Breeding and calf rearing (including free distribution of semen)	Clearly making gains. AI support received. Could afford this themselves. Improvements in calf rearing	Clearly making gains. AI support received. Probably could afford this themselves. Improvements in calf rearing	Clearly making gains and many have received AI support (but some small farmers cannot be reached by LBVD's AI program). Unlikely to be able to afford this themselves. Improvements in calf rearing
Farm records, ear tagging	Were already largely competent in records. Have adopted ear tagging	Able to improve in records area. Have adopted ear tagging.	More difficult in records area due to lack of motivation of small farmers to do this. Have adopted ear tagging

MDEP does not espouse one farming system for all. Within the broad regional environmental commonalities that exist for farmers in their respective regions, advice must be, and is, tailored to the local needs and specific environments of the farmers concerned. In the larger nucleus and focus farms we have heard and seen how extensive beneficial changes have been made. Owners have received and variously accepted MDEP advice about fodder production and management, herd management, shed design, animal health and welfare and milk production. The messages about milk quality have been well received and farms are now able to produce and process milk in higher quantities and to better quality than before.

It is hard to generalise about capacities attained by smaller farmers. There are many of them, in different climatic and geographical areas, with varying access to land, relying on different milk sales and collection systems and having differing amounts of time to devote to dairy. For many, particularly women farmers, dairy herd management is only one of their many daily tasks.

However, the up-take of advice on fodder and forage management and associated practical skills at the farm level is particularly impressive and this work has been highly beneficial. Of the 83 farms closely monitored by MDEP, all are producing fodder for their herds. This is being supplemented with concentrates and crop residues. Many farmers have invested in the production of green fodder. Others purchase fodder from elsewhere and a few local crop farmers are growing fodder on demand. Extensive fodder trials were undertaken in Phase 1. After some early failure due to drought, MDEP has persuaded farmers to grow three beneficial and nutritious species, which are widely used in differing locations and in different stages of the cow's productive cycle. Farmers are being persuaded to reduce the use of concentrate. The adoption of silage has been slow and is still

challenging, but this is starting to happen. MDEP originally intended to help establish specialist forage production units for industry but this has not happened yet, although we note that four farms have in excess of 20 acres under forage, grown for their own use. It is not clear whether the production of fodder on a larger scale for sale will happen in the future, unless large companies see a profitable market, although MDEP sees this as quite possible in the next two years.

Work with farmers on adopting six of eight best farm management practices is sensible<sup>8</sup> and has been a very useful approach, with the March 2018 target of 25% of the 83 closely monitored farms achieving this being met. Sustained effort will be needed until the end of the project to reach the target of 60% of farmers.

#### **Nucleus farm plays mentor role**

At Tawma village near Meikthila, we met the owner of a nucleus farm and collection centre, who is making the transition from a large sweetened condensed milk operation to the production and sale of fresh milk and yoghurt. MDEP and LBVD have been working with the owner for almost four years. His herd is very healthy with the first New Zealand breed heifers due to give birth soon. The MDEP Facility Fund has assisted with the purchase of a milk parlour and co-invested in a grass cutting machine. The farm now has MDEP designed sheds. The owner connects with some 90 local small farms and buys their milk through salaried collectors. MDEP training has been given at the nucleus farm for focus farmers on silage and calf management. The owner encourages focus farmers to visit and discuss dairy issues in situ and has helped to distribute MDEP free seed to the larger group.

MDEP has a modest target of four farms with effluent management meeting project standards. Currently three farms have achieved this and the 2019 target will be met. Awareness of the need to address this environmental issue is growing. Negative environmental impacts from effluent may eventually slow dairy industry development in peri-urban areas where some farmers are increasingly receiving complaints about smell from their neighbours. Establishing suitable effluent management systems across the industry remains both a challenge and priority.

MDEP has supported LBVD's artificial insemination work. Over 500 farmers have received and benefitted from New Zealand semen straws and are now learning to care for the new genetics, with cows that we have seen in good condition. Farms are now managing the first pregnancies of cows bred from NZ straws. Once they have calved and have entered the lactation stage, the proof of concept in terms of increased milk production can be fully assessed. However, this will not occur until after the end of MDEP Phase 2.

Progress is being made variously in some of the small farms we visited in terms of animal welfare including animal shelter, sufficient space, untethering of animals, and provision of water (and sometimes food) on a 24-hour basis. Small farms are making progress in calf health and achieving better heifer first mating weights by supplying enough milk to calves (5 litre/day/calf). The incidence of calf scour, which is common, is starting to be reduced through better calf raising practices. Some farms are practising the separation of milking cows, heifers and calves. The MDEP message has been "happy cows produce more milk and more profit."

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<sup>8</sup> The monitored farm management practices are ear tagging, record keeping, calf weight monitoring, heifer first mating weight achievement, calving interval, 24/7 water and feed available, mastitis monitoring and utilising AI. Ear tagging and AI utilisation will depend on availability of supplies in future.

MDEP use of social media, including useful video material to reach out to dairy farmers has been successful and has been a logical and useful extension of MDEP beyond the farmers with whom it works directly. As at the last annual report, MDEP had attracted 31,650 views on YouTube. By August 2018, the project's Facebook page had 4180 followers. MDEP is now collaborating with local not-for-profit company, Greenovator, in the roll out of dairy farming content through its Greenway application. This software currently has a (free) subscription base of some 95,000 farmers, of whom approximately 20% are women. The application particularly targets farmers who rarely receive extension officer visits and inter-alia allows farmers to draw upon an expert panel from Yezin University and receive daily updates on agricultural commodity prices. At this stage, the number of dairy farmers subscribing is unknown, and it remains to be seen how this system can be linked back to the more comprehensive approach to extension through dairy advisors.

### *3.3.2.2 Encouraging investments*

**MDEP has been effective in encouraging investments. It has helped dairy farmers to develop viable and profitable businesses. Improved milk yields have, to date, been modest.**

As a group, nucleus farmers and processors have been able to gain confidence in their industry. They are seeing the benefit of making investment decisions and are planning on expanding their operations. There is no single pattern of investment, but larger operators have variously invested in better fodder, feeding and watering practices, animal welfare, farm records, improved sheds for cows, effluent management, milking technology (including the use of milk parlours), the creation of testing capacity and the cooling and handling of milk. MDEP has helped to bring about a higher risk appetite among the nucleus farms and processors with which it has worked.

Gains in investment are measured by using the indicator "percentage of nucleus and focus farmers who have invested in at least two of: increased fodder establishment, increased size of herds, farm infrastructure and processing capacity". By February 2018, 30 of the 83 closely monitored farms (i.e. including smaller farms) had achieved this, with all other farms having invested in one area. The target of 80% by February 2019 may be met.

However, this indicator does not capture the potential scale of investments that MDEP helps engender. Increased capacity to take investment risks among larger operators is not solely due to MDEP, as farmers at this level are capable of attaining advice elsewhere and making their own investment decisions. For example, MDEP reports that four major farms have recently made investments of totalling over NZD 4.5 million outside of Facility Funding<sup>9</sup>. MDEP reports that a further investment is being planned in two more farms, totalling about NZD 1.5 million and that investments are continuing in all nucleus farms, with many focus farms also preparing to invest in processing and milking plant. Increase in investments in dollar terms would have been a useful indicator for MDEP to have collected comprehensively throughout the period of the project (this is covered further in section 3.4.3.4 on value for money and section 3.4.4.2 on data collection).

For the medium-term outcome of dairy farming as a viable and profitable business, MDEP uses the indicator "Percentage of dairy farms having annual income that exceeds annual feed and labour costs (i.e. positive gross margin)", alternatively expressed as margin over feed and labour (MOFAL). In this case the project has reported that 87% of the 83 closely monitored farms achieved this by February 2018. This is an important indicator as it shows how one of the central issues in the economics of dairy farming - how to raise milk prices, reduce production costs and improve profits - is being tackled. The target of 90% by February 2018 seems very likely to be met.

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<sup>9</sup> Three of these farms are in the Pyin Oo Lwin area and one near Mandalay. The project works with all these farms; however, these investments were not all made with project advice.

The target of milk yields per cow of 12 litres/day/animal by the end of the project's implementation currently looks unlikely to be met. With a 2016 baseline of between six and eight litres, the figure was 9.3 litres at the end of 2017. MDEP states that production increases will come slowly as improved nutrition lifts animal condition and future calving and milking are progressively improved. This does not, of course, reflect any future increases in milk yield due to the progressive adoption of New Zealand genetics.

### *3.3.2.3 Milk quality and good management practices*

#### **MDEP has been very effective in helping to establish systems for improving milk quality Good management practices are starting to gain traction in the industry**

MDEP has helped to make major improvements in systems for milk quality in Myanmar. Efforts on milk quality have been well conceived to deliver a consistent message that the industry will only grow if consumer concerns about quality and safety are addressed. Support has been consistently provided to develop the government's milk testing capacity and to help processors to understand that their participation in the testing regime is in their own interests. While the system needs further support, particularly to institutionalise a national milk standard, the foundations for milk quality in Myanmar are being put into place.

MDEP has used two indicators to assess progress on milk quality:

- Percentage of fresh milk products from nucleus supply processors consistently meeting approved milk quality standards; and
- Number of days shelf life of Myanmar milk products accepted at Citi Mart Holdings

A national milk quality standard has yet to be formalised for Myanmar, although LBVD is working with other government agencies to achieve this. Current quality is being measured against Thailand's accepted milk standard. On this basis, the target for milk standard is for 75% of 35 processors to meet quality standards by February 2019. The LBVD Laboratory has verified the results reported by MDEP. For pasteurised milk, the target has been reached and should be maintained or improved in the time remaining. 87% and 78% currently meet the Standard Plate Count (SPC) and E. Coli standards respectively. For yoghurt the target may not be achieved. Yoghurt samples submitted up to February 2018 showed 57% and 39% passing E. Coli test and mould tests respectively. MDEP has noted that consistency across successive samples from contributing suppliers is an issue. The target for milk shelf life of 10 days in Citi Mart Holdings is unlikely to be met by February 2019. MDEP reports that most of the milk reaching Citi Mart does meet this standard, but the retailer is being cautious in revising the current four-day shelf life.

Quality is difficult for milk from smaller farms, unless collection and processing centres make extra efforts to ensure it is maintained. Many small farmers rely on collectors to do the milking and to on-sell produce. Adulteration of milk with water occurs among collectors. More critically, their ability to transport milk to a collection point before bacteria grow exponentially is limited. This could be addressed if small farmers can be provided direct access to local milk collection centres, which MDEP is starting to trial. MDEP guidance or training for collectors is through standard operating procedures that are displayed and promoted through larger farms, collecting centres and processors.

Milk Quality work began at the farm with milking management and progressed through the supply chain to the processor and retailer. MDEP has explained that training of key people at each stage



was undertaken and the impact on milk quality over time has been documented through the milk testing regime. This approach has clearly borne fruit.

#### **Milk quality in practice**

At a small farm and milk collection centre near Mandalay, we met a farming couple who have welcomed MDEP and LBVD support on milk quality, particularly important for them as they buy milk from smaller farms in the area through village milk collectors. They have enthusiastically signed up for regular milk sample testing at the nearby LBVD laboratory. With MDEP help the woman has started milk testing on the farm and is now able to tell when milk has been adulterated with water and how fresh the product is. Careful records are kept of the batches of milk received from collectors, who are given verbal warnings if there are quality issues and suspended if the problems persist. The farm prominently displays MDEP's standard operating procedures, has installed a chlorine bath to avoid contamination from footwear and is working on improving its milk cold chain.

LBVD has comprehensively taken on the role of milk testing and reports that it is able to provide a regular service to the milk industry and thus for consumers. If, as anticipated, demands on its services continue to increase, this will have been a major achievement. MDEP milk quality specialists have made six training visits. The lab has been equipped, using New Zealand funds, with a range of test equipment and supplies and staff have been trained to use it. The range of tests that the lab is able to do has been expanded<sup>10</sup>. The laboratory commenced with seven nucleus farms and processors, who send regular, monthly samples to the laboratory and receive test results accordingly. This has been extended to some 30 smaller farms and processors. Test results sheets are provided to participating operators and provide encouragement to aim for higher quality. Regular support and advice is being provided to the laboratory and to the industry by MDEP's Mandalay based milk quality advisor.

MDEP has stated that the aim all along has been that LBVD will become a reference laboratory and every processor will conduct their own testing in their own laboratories. Attempts to commence this were made in early 2015, but the idea achieved no traction from the private sector at that time. Now, with private sector awareness growing of the importance of maintaining quality in the development of their own operations, the number of processors undertaking at least some of their own testing is also growing. MDEP has recently (after the evaluation visit) begun discussions on recruiting a local person who can act as an advisor on testing for the processors. This bodes well for the future but fully instituting a regime of self-testing and laboratory reference/audit will still require support.

MDEP has undertaken some preliminary work on testing for agricultural residues with the Food and Drug Administration, which is in charge of policing good manufacturing practices. With MDEP support, Citi Mart has recently gained capability to operate a GMP based preferred supplier system that encourages the quality and confidence required to attract further consumers, along with improved capabilities in milk handling.

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<sup>10</sup> This includes standard plate count, coliform (E. Coli) plate count, somatic cell count for milk; yeast and mould plate count for yoghurt; and detection of freezing point and antibiotic residues.

3.3.2.4 Dairy extension capacity

**MDEP and LBVD have not been effective in capacity development for dairy extension**

MDEP and LBVD have developed and maintained a good relationship throughout the two phases of the project. LBVD has, within its overall resources, provided veterinary officers to work alongside MDEP advisers. MDEP for its part has involved LBVD officers as much as possible in project activities and has been highly consultative in its dealings with the Department. But the Department's budget and human resources have been stretched throughout MDEP implementation. LBVD is oriented towards provision of veterinary services. Because of the wide variety of animals and associated tasks LBVD veterinarians are charged with, there are significant constraints to the number of veterinarians able to focus on MDEP work and to act as full-time dairy extension officers. The inability for MDEP and LBVD to have been able to create a sustainable dairy extension service is illustrative of a systemic issue recognised in the Myanmar agricultural strategy which states:

“Government needs to redefine its role from that of delivering extension services, which it has not been able to do effectively in the past, to becoming the overall facilitator of a system of pluralistic, farmer-responsive agricultural extension services<sup>11</sup>”.

The strategy articulates the need to better define public and private sector roles in the sector, to create stronger, more industry aligned extension services in all areas of agriculture, and to more fully involve industry in the extension effort.

In Phase 1, a Project Implementation Team (PIT) of 12 LBVD officers was established. They received training as trainers in dairy husbandry at the Taratahi Institute of Agriculture. They were organised in four groups of three (Yangon, Nay Pyi Taw and Mandalay); and one group of national forage, animal husbandry and milk quality and safety specialists in Nay Pyi Taw. One of the national specialists has also covered Northern Shan and has been the LBVD Coordinator for MDEP. National specialists were to provide support to the other PIT members and thereby to a wider group of LBVD officers. This was a logical approach to creating a national dairy extension service, however, there were doubts as to whether the PIT alone would be able to fulfil an extension function.

The Phase 1 Activity Design Document (ADD) recognised “that the LBVD capacity in both resourcing and capability will not be sufficient to support dairy development in Myanmar. The role of the private sector, whether through field officers employed by processors or retailers, or the development of farmer-to-farmer learning groups, will be critically important in Myanmar”. In April 2017, it was noted that of the 20 Taratahi trainees, 14 were still active in dairy promotion and development. The Phase 2 ADD Appraisal noted that it was important to negotiate their full-time availability, but this has not happened, despite MDEP's efforts through ongoing training. By December 2017, they were referred to in the revised results framework as a “national network of competent dairy advisers”.

MDEP confirms that all of the LBVD officers who have completed both phases of extension training remain capable of providing dairy extension services but acknowledges that this does not mean that they are necessarily doing this. They have yet to be designated as dairy experts by LBVD. This is hoped to happen before MDEP finishes in February 2019 and would boost LBVD dairy extension efforts. MDEP reports that those trained undertake dairy work in conjunction with other LBVD activities. MDEP estimates that, where this is happening, 20% of their time is spent on dairy, with focus (inter alia) on artificial insemination and forage. However, by August 2018, there were only three full-time secondees from LBVD, plus two short-term secondees, deployed by LBVD as part of a

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<sup>11</sup> Myanmar Agriculture Development Strategy and Investment Plan (2018/19 to 2022/23), page 19.

series of rotations, plus 22 LBVD counterparts providing some part-time inputs to dairy. The direct counterparts maintain regular contact with their trained extension colleagues around the country. Although these officers are doing excellent work in conjunction with MDEP, and their colleagues have been trained in dairy extension and are deployed around Myanmar, this falls well short of a national dairy extension service capable of meeting the needs of the over 800 dairy farmers registered by MDEP.

The early recognition in the Phase 1 design that the public extension service would not be adequate to meet all dairy farmer needs did contribute to the decision to adopt the approach of working through processors and nucleus farms to provide information and training for focus farms and smallholder farmers. MDEP did recognise from the start that the private sector would have to play a major role in extension. The project continually tried to get LBVD to increase the number of counterparts that could receive on-the-job training. After it finally became apparent to MDEP that this was not going to happen, it was decided to further increase emphasis on nucleus farm involvement in extension.

In July 2016, a paper was approved to the Governance Group that recommended establishing a system of private sector milk supply managers who would strengthen the relationships between suppliers and processors, work with suppliers on raw milk quality and improve competitiveness through improved dairy husbandry. MDEP was to contribute towards salaries of milk supply managers in a reducing sliding scale. No nucleus farms took up this offer at the time.

In the final 18 months of MDEP there has been some movement for the private sector to become involved in dairy extension, with one person from Yangon operator, Silvery Pearl, having received extension training. A further seven private sector people are due to be trained by the end of 2018. There is also the possibility in the future of involving graduates from the new Yezin University Animal Science course, but this will not happen in the current phase. In hindsight, with both project designs recognising the limitations for government extension capacity and the need to engage the private sector, it might have been better to have placed more emphasis on private sector involvement from the start. The creation of an effective dairy extension service, in whatever form, remains a major challenge.

Notwithstanding this, LBVD has taken on board lessons from MDEP. The Department is actively considering ways of better reaching and meeting the needs of medium and small dairy farms, something which is closely aligned to Myanmar's aims to reduce rural poverty and raise incomes. The agency has refined and updated its assessment of what can be done to help develop Myanmar's nascent milk industry largely on the basis of its involvement in MDEP. The agency would like to see replication of MDEP benefits to farmers in other regions of Myanmar. However, LBVD does not seem to have taken on the MDEP extension training approach and packages, which would allow it to replicate the approach elsewhere if resources were available.

LBVD, through involvement in MDEP training in New Zealand and Myanmar, has also been able to assimilate the technical messages on dairy that MDEP has brought from New Zealand. Through their involvement in MDEP, the project's full-time counterpart staff have gained immensely in knowledge and experience to become Myanmar's top government dairy experts.

#### *3.3.2.5 National Dairy Development Strategy*

**Despite technical support from MDEP, LBVD has not yet delivered the National Dairy Development Strategy**

The need for a national dairy development plan or strategy was acknowledged from the design of MDEP Phase 1. The then Ministry of Livestock, Fisheries and Rural Development had already created a National Dairy Development Board (NDDDB) to develop and oversee the strategy and the NDDDB had commenced work on producing a strategy, but this was not completed. MDEP technical support for developing the strategy was included in the Phase 1 design and MDEP consultants and advisors worked with LBVD on drafting recommendations for a dairy development plan. These were submitted to the NDDDB in December 2015<sup>12</sup>.

These recommendations proposed a strategy built around a “cycle of demand” within which increased quality brings increased consumer demand, which in turn encourages increased supply, which creates resource for investment, including in increased quality. The document provides a useful snapshot of the dairy industry at the time and proposed four pillars to help the Myanmar dairy industry to expand, namely: empowerment of farmers and communities; development of milk quality and safety; strengthening processing; and increasing the demand for milk. Activities were suggested for each of these pillars and GoMy roles were proposed including driving quality, promoting investment, supporting milk industry infrastructure development; and creating an enabling environment for capacity building. A revitalised NDDDB was envisaged as leading the plan’s implementation and a governance structure proposed. These recommendations were relevant to the government and industry at the time.

As far as we can see, little has happened to further develop the dairy strategy and its further development remains a challenge. LBVD has not taken the document forward to the point where a draft strategy can be submitted to the Minister. In the intervening period since the recommendations document was produced, the Ministry structure has changed from MLFRD to MoALI and there is a new Minister who has placed more priority on beef development. Phase 2 of MDEP provided for further support through the NDDDB, but the NDDDB has itself not been resourced or functional. MDEP has ceased working on this until the NDDDB is resourced and operational. This will not happen before February 2019.

The strategy recommendations need to go to a next stage where overall pillars and resultant activities are agreed, developed and costed for inclusion in the government budget. Also, a new national agricultural strategy has emerged, and this will need to be taken into consideration in any further work on the National Dairy Development Plan. Given the time elapsed since the recommendations were produced, considerable thought will be required to ensure full relevance of a strategy document to government and industry as they stand now.

It is up to the GoMy to decide in the future what to do about this and ongoing technical support should only be provided where there is evidence that this is a priority and that GoMy has the resources to take it forward.

### 3.3.3 Industry approach and partnerships

#### **MDEP’s approach to industry has been very effective and good relationships have been formed**

The nucleus and focus farm model with aggregation of produce from small farm producers has been very effective and has engendered strong multi-layered partnerships between focus and nucleus farmers, farmers and processors and between processors and retailers<sup>13</sup>. Nucleus farms were

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<sup>12</sup> The recommendations document stated: “This document ... is not an industry strategic plan in the traditional sense. It is written as an aid to NDDDB who will then finalise their NDDP and submit it to the Minister”.

<sup>13</sup> MDEP has noted that not all focus farms are associated with nucleus farms. Similarly, some processor operations are not acting as nucleus farms; they were added to help raise the quantity of milk sold to Citimart. Nevertheless, most MDEP focus farms do benefit from a nucleus focus relationship and we conclude it has been central to MDEP’s approach.

selected in conjunction with LBVD and MDA and focus farms were initially selected with LBVD Township Officers. Significant progress has been made. Processors and retailers have an established interest in maintaining effective partnerships, and their businesses are built around this. MDEP has helped to strengthen these partnerships, particularly through the emphasis on milk quality systems. The development of strong and lasting relationships between nucleus or processor operations and focus and/or small farmers has been slower, partly because of the sheer number of potential partners who need support and partly because it is an incremental, ongoing task to instil better practices at the smaller end of the industry. The approach recognises that Myanmar's milk production is geographically dispersed and that small farmers make up a large part of the country's milk production.

Nucleus and focus farmers are emerging as mentors for smaller farmers. Several larger farms we visited are warmly welcoming visitors from smaller farms in their region and MDEP notes that two large farms are receiving up to 100 visits per month. One processor regularly and willingly hosts visitors from all over Myanmar to the nearby LBVD laboratory in Mandalay and is happy to demonstrate milk quality procedures on-site. Farmer-to-farmer extension is an important element in encouraging the adoption of new farm management systems and technologies.

Farmers across the board talk of positive experience from the MDEP extension services that have been provided. While many probably expected a lot more for free at the beginning, they have been able to benefit from various subsidised inputs. Farmers have responded well in taking on new techniques and technologies. MDEP has done this very well and has been a driver of change. Although it is a little counterintuitive to expectations of developing a local dairy extension service, farmers do appreciate the experience, knowledge and confidence that New Zealand and their trained counterpart advisers bring and feel that they can rely on their help. Farmers do understand that Myanmar is constrained in resourcing a full dairy extension service at this stage, especially as government officers have not been dairy farmers. The MDEP approach is seen as user-friendly. The discussion group approach has been welcomed by female and male participants alike.

MDEP has introduced a refined approach/model in the form of the Tapel Village Milk Collection Centre. This adds a local processor in an area where taking milk to existing processors is time consuming and where the cold chain is currently impossible. It also aims to cut out milk collectors and bring a higher price to the local farmers. The centre is based in a village where many families are involved in dairy farming. It involves the establishment of a village management committee for the collection centre, along with associated governance mechanisms. MDEP is co-financing infrastructure and the village is contributing.

The Tapel model is potentially a good refinement, as it can provide a viable alternative in areas where a more usual collection and processing approach is not possible. The centre is not yet running and negotiations on governance are still underway. An attempt to involve a private sector buyer for the milk has recently fallen through. While local people can be easily trained in the technical skills required, there are attendant risks for this operation (and for the approach) around building sufficient management and governance capacity. If New Zealand support for the milk industry does not continue after February 2019, this initiative will not come to fruition.

The Myanmar Dairy Association plays a vital role in bringing together players in the dairy industry. Established in 2004 as a subsidiary of the Myanmar Livestock Federation (MLF), the MDA now has some 1200 members. It represents industry efforts for safe, hygienic production; and to move towards import substitution. It also seeks to maintain good relations with government and to lobby for, benefit from and follow GoMy strategies and regulations. MDEP established a good relationship of mutual support with MDA.

### 3.3.4 Collaboration with other projects

#### **MDEP has strategic relationships with MITA and OIE projects**

There are strategic associations between MDEP and the two other closely related New Zealand funded activities: the Myanmar Industry Training Activity (MITA) and a World Organisation for Animal Health (OIE) implemented initiative to help control foot and mouth disease (FMD). Both projects are co-located with MDEP in the LBVD regional compound in Mandalay.

MITA, which commenced in March 2018, has close links with MDEP regarding vocational training for the dairy industry. MDEP has recognised throughout that there is a need for better vocational training for the dairy industry in Myanmar. We understand that MDEP explored options with the Yezin Agricultural University for farm management training within the animal sciences degree curriculum. However, Yezin did not take this up at the time and MDEP was never resourced to provide significant support in this area. Instead, MDEP recommended to MFAT that a planned activity of support for vocational training in Myanmar include this and was involved in the ensuing design process for about a year. MITA is the result and as MITA develops, the two projects have major potential to collaborate on vocational training for livestock.

MITA works alongside the Netherlands Initiative for Capacity Development in Higher Education (NICHE) programme to help “livestock educational Institutes and vocational training systems to provide a sufficient supply of qualified and competent people to meet the needs of the livestock sector”. It is working with Yezin University at degree level and Myanmar’s State Agricultural Institutes at vocational training level to develop curriculum, teaching resources and lecturer capacity as well as to explore short course options. It is working with LBVD to enhance its capacity to deliver competency based training for the livestock industry workforce. MDEP is complementary to MITA’s work. MDEP advisers and LBVD vets are seen as pivotal for MITA in terms of connections with farmers and industry and in support for on-farm training. MDEP is providing content for the new curriculum being developed by MITA. MITA will work with LBVD’s training unit to finalise the curriculum. MITA hopes that in the future a New Zealand dairy activity can continue to help with review of curriculum and training delivery.

OIE’s project provides FMD vaccinations and associated capacity building for LBVD and community animal health workers. It works in 18 townships in Mandalay and 6 in Sagaing and is beginning to expand into the Yangon and Naypyidaw areas. MDEP has cooperated with this initiative and during an outbreak of FMD, MDEP funded about 5000 doses of vaccine.

MDEP has encouraged counterparts to apply for New Zealand Scholarships awards with to date one person being accepted from the LBVD Laboratory to study microbiology at Massey University. Two MDEP counterparts were accepted for ASEAN Training Awards for training on a Food and Agribusiness Value Chains course, also at Massey University, one from Citi Mart and one from a major processor. Trainees applied independently for these awards and were not sponsored by MDEP, but the project has advocated for study opportunities for counterparts where this complements project objectives.

MDEP maintains communications with and has benefitted from past work of the Food and Agriculture Organization (FAO) in Myanmar but is not currently involved in any formal collaboration. Between 2004 and 2010, FAO supported two projects for the Myanmar dairy industry<sup>14</sup>, both of which fed information into MDEP’s Phase 1 design. During Phase 1, the LBVD laboratory as

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<sup>14</sup> The Small-Scale Dairy Technology Transfer and Training Project and the Dairy Cattle Improvement Project

supported by MDEP was positively audited by FAO. At the time of the Phase 2 design, FAO commissioned an assessment of the dairy value chain in Yangon and Mandalay, which has been of use to MDEP.

### 3.4 Efficiency

#### 3.4.1 Management and Resourcing

**MDEP has largely been managed efficiently but would have benefited from a stronger focus on gender and M&E and more full-time human resources**

##### 3.4.1.1 Technical Capability

The expertise of MDEP people (from Myanmar and New Zealand) has largely been appropriate and well received. Advisors and their Myanmar counterparts are experienced and knowledgeable and have significantly contributed to results. The mix of general dairy farming skills and required specialisations has largely been appropriate, although additional specialist resources for gender and monitoring and evaluation would have strengthened implementation.

Short-term advisers have been available to be deployed to Myanmar at appropriate times and several New Zealand advisers come with extensive other country experience. Technical assistance has been strengthened with expertise from other New Zealand organisations, including the Taratahi Institute of Agriculture, the New Zealand Cheese School, the Livestock Improvement Corporation (LIC) and Quality Consultants New Zealand (QCONZ).

As flagged above, MDEP could benefit from specialist support for gender and social inclusion and M&E. Although there is evidence that MDEP has tried to address these issues more comprehensively in the last year, neither received sufficient priority during implementation. M&E capacity is covered in more detail in 3.4.4. Please refer to 3.7.1 for discussion on MDEP's outcomes around gender and social inclusion, where we conclude that too little has been done, too late.

##### 3.4.1.2 Staffing

A significant resource challenge for MDEP has been that it has not had enough Myanmar or New Zealand people working on the ground full-time. The limitations on LBVD officer time have been noted above and have been critical in the difficulties in establishing a national dairy extension service. This has meant that dairy extension has largely been the responsibility of New Zealand advisers and a small number of Myanmar advisers from LBVD.

At the commencement of MDEP in March 2014, all advisor support was provided on a short-term basis. In September 2014, the Chief Technical Advisor (CTA) was based in Mandalay on a long-term basis and this continued throughout Phase 1. Early in Phase 2, the CTA went onto a short-term basis and it was agreed that MDEP would have three dairy advisors based in Mandalay. Some staff have left and been replaced but at the time of this evaluation MDEP employs two full-time dairy advisors and a milk quality advisor. Except for resources for M&E and gender, the mix of short-term advisors appears to have been good.

LBVD is currently providing three core MDEP staff members, two in Mandalay and one in Nay Pyi Taw (who acts as MDEP project coordinator for LBVD). For some time, LBVD has also provided between 2 to 4 short-term officers to work with MDEP on a rotational basis. As at May 2018, there were 22 LBVD officers trained by MDEP; 4 in Northern Shan, 4 in Southern Shan, 9 in Mandalay, plus 3 in the Mandalay laboratory, 1 in Sagaing and 1 in Yangon. These officers are providing some inputs into dairy development but are not able work full-time on the sector.

The needs of the dairy industry have grown significantly over the last four and a half years and this has left MDEP personnel stretched in terms of time allocation and logistics. Because of human resource and logistics pressures and the number of farms it is already supporting, MDEP now finds it difficult to respond to individual new entrant demands for support. Understandably, it is easier to take on new farms when they can be grouped within a locality. Tapel village, where a collection centre is being established, is a case in point.

MDEP's achievements documented under Section 3.3, Effectiveness, are significant. MDEP advisers have managed to achieve much during this time with the resources available, which speaks of project efficiency. However, with more human resources from Myanmar and New Zealand, the project reach, achievements and impact could have been greater. This is a consideration for any future support from New Zealand. The original design for MDEP assumed that a small number of New Zealand advisors could train and put into place a government led dairy extension service that would be capable of reaching and training beneficiary dairy farmers. For reasons given above this has largely not happened and has meant that the majority of extension work has been carried out by a small number of Myanmar and New Zealand personnel. In hindsight MDEP could have sought other mechanisms to provide this service, for instance working earlier with (and resourcing) private sector extension agents and measures such as this might have averted the problem of insufficient extension capacity. However, given the situation that the project found itself in, MDEP would have benefited from being able to bring in additional human resources as required.

The geographical spread of dairy operations has been a challenge for MDEP staffing. With the few people available full-time, servicing the needs of farmers in Mandalay, Yangon, Nay Pyi Taw, Shan and Sagaing has meant that advisors and counterparts have spent significant portions of their time on the road. This is critical in the case of servicing Shan State. An out-based adviser in Southern Shan would be a good option to improve efficiency.

#### 3.4.1.3 Adaptive Management

When MDEP started, New Zealand had not previously worked in dairy in Myanmar. The demand and industry for fresh milk was barely existent and Myanmar had only opened up for donor activity in 2012. MFAT and MDEP have had a collegiate relationship throughout implementation and have maintained useful dialogue. MFAT has managed MDEP from both Wellington and Post<sup>15</sup>. MFAT, MDEP and LBVD have maintained good communications throughout.

Given the new and emerging context of Myanmar, and MFAT's engagement in the dairy sector, MFAT and MDEP have worked adaptively with LBVD support, and MDEP has been provided with flexibility to respond to lessons and contextual changes and adapt its responses and investments to industry needs. An example is MDEP's efforts in recent months to reopen efforts to undertake dairy extension through working with the private sector, which has been a logical and reasoned response to extension capacity issues within government. Other examples are MDEP's work to extend the reach of its technical support to more farmers through the use of social media and the replication of project activities in Sagaing Region. The regular review of the results framework and approval of revisions further exemplify this adaptive practice and efforts by MDEP to build on what works well.

#### 3.4.1.4 Risk Management

Risks were identified in matrices in both designs and have been well managed by MFAT, MDEP and Myanmar partners. There have been no serious operational problems. MDEP and its partners have been able to maintain relationships and their work together. The risk of ineffective and

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<sup>15</sup> Post engagement was initially from Bangkok, but more recently from Yangon.



inappropriate use of the Facility Fund has not eventuated and fund use has followed guidelines (please see Section 3.4.3.3. for further detail).

The identified major risks to outcomes include farmers not adopting technologies and practices because of low profitability. This has been managed well through being able to demonstrate profitability in focus farms. The risk of lack of investment in dairy farming has not eventuated and with MDEP support, particularly through the Facility Fund, investment is increasing. The latest annual report mentions the risk around LBVD's capacity for extension: "that there will not be the level of extension support that can sustain the changes made through MDEP"; has not been resolved and remains a future challenge.

### 3.4.2 Governance

#### **Governance arrangements would have benefited from clearer definition. Meetings should have been documented**

In Phase 1, MDEP was governed through the New Zealand Dairy Activity Steering Committee, which brought together representatives from LBVD, the Myanmar Livestock Federation and the National Dairy Development Board with New Zealand representatives from MFAT and the New Zealand private sector (Fonterra) and with the MSC providing secretariat services. In Phase 2, the New Zealand Dairy Activity Governance Group (a change of name) has been similarly structured but has added three more representatives from Myanmar; from MoALI's Departments of Agriculture and Rural Development and from the Food and Drug Administration under the Ministry of Health. By the commencement of Phase 2 a Memorandum of Agreement (MOA) was in place to cover MDEP.

Both designs provided Operational Charters for the governance body. The roles of the governance bodies have been to maintain an overview of MDEP and other related development activities, liaise with stakeholders and to provide guidance and support to LBVD and to MDEP. In Phase 1, the Steering Committee was also charged with assessing recommendations for the Facility Fund, but this was dropped in Phase 2. Both iterations of the governance body have had a major role to advise MFAT, which has had the final say on MDEP budgets and work plans. However, the Charters do not provide detailed guidance on how these governance bodies were to be involved in decision making or how recommendations to MFAT, LBVD or MDEP were to be communicated.

Despite requests, we have not received minutes from the governance meetings. It is not clear if these have been taken and therefore it is not clear the extent to which governance groups have fulfilled their advisory roles. Our observation of the Governance Group meeting in August 2018 is that it was a useful meeting from the perspective of different stakeholders providing reports on activities, however, there was no real opportunity for dialogue and major decision making.

MDEP has rightly reported that the creation of the Technical Advisory Group during Phase 2, to bring together representative nucleus farmers and processors with LBVD, has been a useful addition. While Technical Advisory Group members are not a formal part of the Governance Group, they do attend its meetings. MDEP arranges field visits in the Nay Pyi Taw area for the group, bringing an opportunity for LBVD and industry to examine technical and industry issues together.

### 3.4.3 Expenditure and value for money

#### 3.4.3.1 Expenditure and allocations

#### **Expenditure is within budget and allocations have been appropriate to the design**

Financial management of MDEP appears to have been of good quality. Inputs have mostly been provided on time and have been accounted against the budget in an identifiable manner in project reports. Variances have been justified. The allocation and reporting of budgets against outputs has been a useful feature of financial management and enables assessment of value for money (see 3.4.3.4).

The table below is an estimate of what has been expended against budget over the two phases of MDEP, to February 2018. Phase 1 was implemented with nine outputs; in Phase 2 this was simplified to four. For this evaluation’s analysis purposes and for comparison, expenditures for the outputs for Phase 1 have been combined into the output categories used for Phase 2<sup>16</sup>. This table does not include data on MSC management fees or MFAT’s own costs to manage MDEP, which was not available.

Table 4: Expenditures by output area for MDEP March 2014 to February 2018

Output area	Budget	Actual expenditure	Variance against budget	%age variance against budget	%age of total expenditure
Non-specific/management costs	543012	521440	21572	4.0	11.2
1. Profitable and productive dairy farming systems	2358260	2664150	-305890	-13.0	57.4
2. Capacity development programme for dairy farmers and extension officers	783742	576477	207265	26.4	12.4
3. Milk quality improvement practices	752380	607546	144834	19.3	13.1
4. National Dairy Plan	363958	140428	223530	61.4	3.0
5. Unallocated	134810	131917	2893	2.1	2.8
	<b>4936162</b>	<b>4641959</b>	<b>294203</b>	<b>6.0</b>	<b>100</b>

MDEP has been managed within budget. The underspend of 6% is modest and can be resolved by the end of the project.

The single over-expenditure area is for the work on dairy farming systems. This is reasonable, given the significant progress that has been made through reaching an increasingly large number of farms in widely dispersed geographical areas. There are three main reasons for the large percentage under-expenditure on capacity development. Firstly, it reflects the lack of progress in developing a national dairy extension service. Secondly MDEP had intended to work with the LBVD Training Unit to build their skills, the output of which would be a curriculum for dairy husbandry and dairy extension. When it became clear that this work would be transferred to a separate project (MITA), MDEP activities planned to achieve this were shelved. Thirdly, MDEP says that it has increasingly recognised that competency would only increase through on-the-job training and thus put more emphasis on the practical aspects of dairy husbandry, funded under the dairy farming systems budget.

More could have been spent on milk quality but given the extensive progress that has been made in this area, the underspend represents an efficiency. Most of the expenditure on the national dairy

<sup>16</sup> This allocation is based on Phase 1 outputs for “improved forage”, “cost effective diets “and “improved breeding and animal welfare” fitting most closely under Phase 2 output area 1 as per the table. We have not been able to allocate the Phase 1 outputs for “processing and product diversity” and “market analysis” within the Phase 2 framework. These are included in the table as unallocated. Phase 2 outputs 2, 3 and 4 align closely with Phase 1 outputs.

plan was made in Phase 1 and the budget for this in Phase 2 has been virtually unspent, as the plan has not progressed. The “management and non-specific” category of expenditure has included direct costs of managing and running MDEP as well as modest costs for advisers working on M&E, gender and environmental management.

#### *3.4.3.2 Funding and resources for industry needs*

##### **The MDEP funding and resource structure has been appropriate to Myanmar’s dairy industry needs to date**

The funding and resource structure appears appropriate for the needs of the Myanmar dairy industry to date. At the start of MDEP, the dairy industry was relatively small in size. With some larger farms as the exception, capacities were mostly at a low base in terms of milk production, farming systems and farm management, and milk quality. Dairy extension was clearly needed. Consumer demand for local milk was low. The resource structure developed for MDEP has been appropriate to these needs. Sound farming systems, which have utilised the largest share of MDEP’s budget, form the obvious starting point for industry development. Regardless of outcome achievements, resources spent on extension development, milk quality and the national strategy have been commensurately lower. This is appropriate.

GoMy and industry players wanted to develop their industry, and New Zealand was in a good position to assist and had the expertise to do so. It has been a good option for Myanmar to use a technical assistance approach utilising New Zealand advisers<sup>17</sup> as there was little local capacity with which to develop the industry. Overseas investors were reluctant to invest in developing the industry because of its small size. The Myanmar dairy industry itself did not have the appetite to take major investment risks; this has only started to improve during Phase 2 of MDEP. We are unsure of the extent to which other resources such as local consultancy groups or non-government organisations could have been used to augment New Zealand expertise<sup>18</sup>. This option is not mentioned in design documents and could be an alternative to consider for future resourcing of New Zealand support.

#### *3.4.3.3 The Facility Fund*

##### **Designs did not well define the role and operations of the Facility Fund, but it has been operated fairly according to agreed co-investment rules**

The MDEP Facility Fund was set up to share risk in selected investment by the dairy industry in essential technology that would improve profitability and farm practices. As articulated in the Phase 1 design, the Fund was intended to complement technical assistance and assist investment in dairy processing, waste management and animal welfare. Facility Fund disbursements were to be approved by the Steering Committee, as it was called at the time. While design documents did not clearly articulate the role of the Fund and how it would operate and be governed, by May 2015, guidelines were in place and the first funding tranches were disbursed to farm applicants. By this stage, the Steering Committee had authorised the LBVD Director General and the Project Director to approve applications. The Fund did thereafter experience some delays in approval from the GoMy side, and as a result approval responsibility was, and remains, vested solely in the Project Director.

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<sup>17</sup> A large portion of MDEP expenditure, in excess of 60% in Phase 1 and more in Phase 2, has been on New Zealand advisor technical assistance.

<sup>18</sup> A search of the Myanmar Information Management Unit (MIMU) website came up with 27 NGO organisations listed under the agriculture sector. It is not likely that many NGOs are specialists within the dairy sector. For the future it would be useful to gain more understanding of capacities of local consultancy or NGO groups to take on roles in dairy extension.

The guidelines for the Facility Fund are still in operation. Ten categories of equipment can be purchased<sup>19</sup>. In designing the guidelines, MDEP recognised that focus farms would have less access to funding of their own than nucleus farms and so were allowed higher percentages of MDEP co-investment than nucleus farms for selected categories of purchases. Nucleus farms are restricted to a 25% co-investment from the Fund, except for forage related equipment, which can be funded to 50%. Focus farms are similarly restricted to 25%, except for 50% contributions for forage, milk chilling, effluent management and animal welfare equipment. Our review of the use of the Facility Fund can confirm that these rules have been applied. New Zealand has contributed 35% in total of all Fund investments. There was a heavy demand on the Facility Fund in the first two years, which has since fallen considerably. MDEP has said that the practices and technologies that they wanted to see (initially) are now all in place in recipient farms and no longer need incentives. The project is also of the view that additional use of the Facility Fund is still justified in some cases, the new processing facility at Tapel being an example.

#### 3.4.3.4 Value for money

### The majority of the MDEP investment has been good value for money

MFAT defines value for money (VfM) as “achieving the best possible development outcomes over the life of an activity relative to the total cost of managing and resourcing that activity and ensuring that resources are used effectively, economically and without waste”.

Based on the expenditures as per Table 4 above, we have briefly assessed VfM across the different output areas. This is summarised in Table 5 below and further explanation given following the table.

Table 5: MDEP value for money by cost structure

Output area	Expenditure	What has been or is being achieved?	Is this good VfM?
Non-specific/ management costs	521440	The project has been managed satisfactorily. Management costs are not excessive.	Yes
Profitable and productive dairy farming systems	2664150	Significant positive changes have been made to dairy farming systems. There are good increases in margins over food and labour and major investments in farms have been or are being leveraged.	Yes
Capacity development programme for dairy farmers and extension officers	576477	Appropriate competencies have been attained by MDEP trainees but Myanmar does not yet have an operational dairy extension service.	Moderately
Milk quality improvement practices	607546	A national testing service has been created. Processors are increasingly subscribing to it regularly. Myanmar’s largest supermarket chain has established an approved milk supplier system.	Yes
National Dairy Plan	140428	This has stalled. Project expenditure on the plan has been reduced.	No
Unallocated	131917	Not assessed.	-
	<b>4641959</b>	<b>Output areas 0, 1 and 3 representing 82% of expenditure have been good VfM.</b>	<b>Overall yes</b>

<sup>19</sup> These are: 1) milking sheds, 2) irrigation and 3) electric fencing equipment; 4) forage choppers and forage conservation equipment; 5) electric generators; 6) milk chillers for milk collection centres; 7) milk processing equipment to improved product quality and/ or the range of products produced; 8) milk quality testing equipment; 9) effluent management; and 10) animal welfare improvement (equipment).

### **Major gains**

As mentioned in Section 3.3.1, there is sufficient data for confidence that MDEP is helping farmers to make financial gains. MDEP estimates that the average gross margin per month per monitored farm, expressed as margin over feed and labour (MOFAL), increased from NZD 1,041 at the start of farm involvement with MDEP, to NZD 1,774 at the end of March 2018. We suggest that aggregating this data over the 83 closely monitored farms covered by this data would indicate a return from the MDEP farm level investment of about NZD 730,000 over a period of a year. MOFAL has been measured and calculated at each MDEP farm visit and entered into the CommCARE app. The project recognises that it is a broad brush means of understanding farm businesses. It does exclude costs such as power, transport, communications, wages of management staff and costs of animal mortality. It does not take into account sale of animals or manure. We have not been able to fully verify these figures, but nevertheless accept them as a reasonable and useful estimate. It would have been more useful for this data to have been collected and analysed for more farms and for a longer period as an aggregate across the industry for a more extensive period of time would give a better picture of significant gains<sup>20</sup>. Data collection is covered in section 3.4.4.2 below.

Investments have also been encouraged. Using the most recently available figures for Facility Fund approvals (regardless of whether purchases have been finalised), participating large farmers will have invested some NZD 185,000, for a New Zealand investment of just over NZD 100,000, which given that the fund co-invests as a subsidy, is good VfM. We have heard of four larger farms that have in total recently invested around NZD 4.5 million. Unfortunately, there is no data available to provide a better picture of aggregate increase in investments leveraged by MDEP. For instance, smaller farmers, which MDEP recognises are making investments, might as a large group add significantly to understanding how much investment MDEP has directly encouraged.

### **Profitable and productive farming systems**

This is the largest expenditure area for MDEP and will utilise at least half of the total allocation for the project. This is commensurate with the major effort that MDEP has made to help farmers put in place better dairy farming systems and with the large number of achievements made. For the 282 farms with which MDEP is most closely working, costs average around NZD 9,500 per farm. This is skewed toward larger farms, because of greater investments of funding. However, most of the gains made by farms in margins and investments for the future come directly from advisor visits and other inputs to farms under this element of MDEP. This has been good VfM.

### **Capacity development**

The following table summarises the formal training courses provided by MDEP over its first four and a half years and the number of trainees from government and the private sector are noted. The number of female trainees has been provided, where known.

*Table 6: Trainees in MDEP formal training events*

<b>Formal Training</b>	<b>Phase</b>	<b>Total trainees</b>	<b>LBVD</b>	<b>Private Sector</b>	<b>Women</b>
Taratahi Dairy Husbandry 2 courses of 6 weeks in Phase 1	1	20	16	4	3
Hamilton Cheese Making course	1	6	2	4	4

<sup>20</sup> MDEP is of the view that aggregating MOFAL for the larger number of 291 farms (not all closely monitored), but where management advisory work is being undertaken, would be an imperfect measure of the impact of the project. However, their view is that it can be used as an indicator of what is happening in the sector because of MDEP. For the record, our aggregation of this would indicate gains of in excess of NZD 2 million.

Formal Training	Phase	Total trainees	LBVD	Private Sector	Women
Sri Lanka Study Tour Milk Quality	2	8	2	6	Not known
First round extension training	2	15	15	0	Not known
Second round extension training	2	23	17	6	Not known
Advanced dairy management training	2	18	18	0	8
Extension practice – discussion groups	2	15	15	0	6
Extension Practice – Farmer practice change	2	28	20	8	9
Extension Practice – Planning extension activities	2	34	26	8	15
Totals		167	131	36	42 Full total not known

It is not possible to properly assess VfM for capacity building under MDEP. Despite reporting that it has observed improvements in trainee capacities, MDEP has not undertaken formal post training assessment (tracer study), which might inform us of what trainees have done with the skills and knowledge they have gained, if they are still working in roles where technical and extension skills they attained are useful or how target organisations and beneficiaries have used the training to build the capacities intended. We have for example noted under Effectiveness (see 3.3.2.4) that LBVD officers have been trained to undertake extension work but they are not doing this full time and that an extension service has not yet been effectively built.

An average of about NZD 3,450 has been spent on each trainee. Some caution is required in interpreting this figure. Training noted in Table 3 above includes higher profile formal training events. It also includes more costly international training, which raises the average cost, but does not include extra less formal training that has been provided, which would reduce it. MDEP has provided an example of silage training in Southern Shan, where over 200 people attended. Events such as these are not captured in the above table. We have not seen information as to the number of other people who were trained by MDEP as a result of transfer by trainers. Notwithstanding these cautions, the average amount spent per trainee is not considered excessive.

While competencies have clearly been gained by MDEP trainees, because of constraints around the creation of a dairy extension service and in the absence of better documentation, we conclude that capacity building efforts have been moderately good value for money.

### **Milk quality**

Training for the LBVD laboratory is well documented with four courses in Phase 1 and 2 in Phase 2. Laboratory staff are capable of appropriate tests for milk and yoghurt and are undertaking these tasks. The Phase 1 activity completion report noted that “MDEP has set up a national dairy laboratory within LBVD. This laboratory is capable of testing milk from around the country, can be used as a reference check for processor owned laboratories, and has staff capable of training the private sector to set up their own laboratories”. Our visit and discussions with the staff at the laboratory and discussions with MDEP advisers and processors confirms that this assessment is correct. The number of samples tested per year has risen from 131 in 2015 to 1480 in the first half of 2018 and the laboratory has gained capacity in the number of tests it can now handle.

For their part, a growing number of processors and larger farms are submitting monthly samples for testing at the laboratory. While consistency between samples is still an issue, it is clear from

discussions that processor do know what to aim for. With project support an approved milk supplier system has been established by Myanmar's largest supermarket chain, which is using good manufacturing practice and principles to undertake random inspections of processing companies.

Milk quality in Myanmar will require further support if it is to be fully sustainable. However, the expenditure of NZD 600,000 to help the creation and development of a national testing service, the participation of a large number of processors in the testing programme and the adoption of GMP by Citi Mart indicates that MDEP's contribution has been very good VfM, and particularly so as consumer demand is on the rise.

### **National Plan**

With attempts to produce and have approved the NDDP and with the lack of action by the NDDB, the process has stalled and will not be completed by the end of February 2019. There will be no tangible output or outcome. The NZD 140,000 spent on this is mostly from Phase 1. Only 40% of allocations for this over the two phases have been spent (mostly in Phase 1), an appropriate and efficient response to circumstances. Notwithstanding this efficiency we conclude that this outcome has not been good value for money.

#### 3.4.4 Monitoring and reporting

##### *3.4.4.1 Monitoring and reporting capacity*

#### **MDEP M&E capacity has improved over time but the project t could have benefited from a stronger evidence based M&E system in its early stages**

MDEP has had three iterations of its results framework. The first (Phase 1 design) was oriented around nine outputs. The second, (Phase 2 design), had an improved focus on outcomes, with a simplified structure of four outputs. The third, submitted in December 2017, used the same outcome and output structure, but used a refined, much clearer set of indicators.

Despite being anticipated at design, no comprehensive baseline has been established. Although we do acknowledge that at the inception stage this may have been very hard to achieve due to the need to learn about the Myanmar dairy industry and the capacities and aims of industry players, the question as to why a baseline survey was not subsequently attempted remains.

Early reports for phase 2 did not report against the results framework. After the third results framework was approved, the latest annual report provides a good and comprehensive account of progress against the framework. In this regard, while for much of the project period MDEP did not report adequately against its agreed results framework and there is no consolidated data against outcomes and outputs for the whole period of the project, MDEP M&E capacity appears to have recently improved considerably.

MDEP has not had a burdensome reporting system and reports would appear to largely serve MFAT's purposes. Financial reporting has been consistent and well-structured and narrative information on project progress has been useful.

We question the approach to using milestones for reporting in MDEP. Traditionally, these are used to trigger payments against contractual outputs. But for MDEP business process milestones, such as submission of reports and annual plans, which have been achieved, are mixed with development milestones, some of which have not. We understand that MFAT does pay the MSC on the basis of

submission and approval of reports and suggest that the inclusion of development milestones is not necessary.

MFAT's Pacific and Development Group has a Strategic Results Framework (SRF) for 2018 to 2020, which is based around the Sustainable Development Goals and which supports evidence-based learning. It aims to aggregate results against standard indicators that reflect development priorities. For agriculture, the following indicators are used:

- average income of small-scale food producers, by sex and indigenous status (in targeted communities);
- number of people (including youth) receiving income from agriculture in targeted communities;
- number of people applying new agriculture technologies, systems or practices; and
- number and percentage of people showing improvements in skills, knowledge after receiving agriculture training/support.

While these indicators are appropriate to MDEP, the project was designed before the SRF was developed and has not been resourced to collect this information. Indicators such as these do help to provide a line of sight between MFAT and the activity and would be usefully included in the design of any future dairy industry support.

#### *3.4.4.2 Data collection and enhancing the MDEP story*

**Field data collected by MDEP is useful but methods for aggregating data are not transparent. Industry data could be strengthened. MDEP could enhance the story of its successes**

Now that MDEP has a workable results framework and is using it for reporting, the data being collected is appropriate for monitoring progress and identifying challenges. MDEP has collected useful basic farm data through the use of two field monitoring tools that help in having an ongoing picture of the progress of farms and farmers.

The CommCARE application, which is client configurable, runs on mobile phones, allows data to be entered at the farm and incorporated into an online resource and is as a tool for MDEP to keep track of what advice farmers have been given and what progress they are making in implementing it.

MDEP also maintains a spreadsheet that aggregates information on farms. Originally created from LBVD sources, the latest (July 2018) version includes 956 farm entries. The spreadsheet shows 291 farms, with which MDEP has had contact and done some work. Of these, 82 are highlighted, which are closely monitored by MDEP and more often visited. This datasheet records number of milking and non-milking cows, milk produced and margins over feed and labour.

This dataset uses a sample size of the number of farms with which MDEP has had contact against the data set provided originally by LBVD and as such is useful and relevant for MDEP's work. It cannot be used to compare against the total population of dairy farmers in Myanmar and wasn't established to do this<sup>21</sup>. The dataset has been used to aggregate margins over feed and labour to demonstrate progress in farm profitability for the farms with which MDEP has worked most closely with and we accept that these figures are useful and informative. We have noted that some caution is necessary

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<sup>21</sup> We have not been able to access published data (notably the 2010 Myanmar Agricultural Census) that might give the number of dairy farmers in Myanmar. Broad estimates were provided in the MDEP Phase 1 design document of about 100,000 dairy animals in the country considered as dairy breeds or cross-breeds, but farm sizes were noted as varying considerably depending on region and socio-economic status of farmers. Many animals were also being used for draught purposes. The source of this information from MDEP was not clear.



around consistency of data updates over time, as clearly these figures can only be updated when a visit is made to the farm; and that this tool may not be suitable for calculating aggregate gains in MOFAL over a wider range of farms. This is useful as a record of MDEP work and enables analysis of progress in these farms against some of MDEP's indicators, and as such is relevant to MDEP's work.

In a best monitoring practice sense, tools like these should help to provide a line of sight between what is happening in the field and what is reported to the donor across all agreed project indicators. The MDEP farm spreadsheet does not cover all indicators, for instance the adoption of the MDEP recommended farm investments and six best farming practices. This information must come from CommCARE, to which we have not had access, so the method of calculation is not apparent. We simply suggest that in the future the line of sight be made more transparent.

It is information of this calibre that allows the donor to have confidence in the data they are receiving. With sufficient data in the system, it is also possible to make estimates as to achievements of outcomes and the impacts a project is making. This is demonstrated above for aggregate margin over cost and labour. Information like this is valuable for justifying financial investment made in MDEP and in any ensuing activities. It also provides a macro-level view of trends within the industry.

There are other areas of industry data that it would be useful to collect; for instance, increases in investment that the project is able to leverage. MDEP does have data on investments approved and/or finalised with Facility Fund support. As an aggregate this also shows a good return on New Zealand's investment (given that the fund was intended to provide co-investment subsidy). MDEP is able to report farms that have made significantly higher investments, at least partly as a result of project advice. Unfortunately, this information cannot be independently verified or aggregated more comprehensively across all farms supported, because it has not been systematically collected. It should be noted that while small farm investments may be modest, the aggregate over several hundred farms is likely to be significant.

A similar argument can be made for systematically collecting information on increased sales made by all stakeholders within the value chain. Some estimate of sales from farms may be possible with the data MDEP has on milk production, milk price and margin over feed and labour. If increased sales made by input suppliers, processors and retailers could be sourced this would likely add up to an impressive figure. Collecting this data, however, is a challenge for any future support to the industry as it would require systems in place to record a wide variety of supplying companies and their increased sales (sometimes companies are reluctant to release this data).

MDEP reporting would be strengthened by including some case studies to help build a stronger narrative about achievements being made by its partners. It would be very beneficial to document success stories in illustrated story form with a qualitative analysis of what made them successes. A well-chosen mix of quantitative and qualitative data can be powerful in persuading other industry players to follow suit and in publicity for the contractor and the donor. This approach would be useful for documenting gender and social inclusion results of MDEP.

#### **Turning the business around**

At a large farm that we visited, the manager told us that with MDEP assistance milk yield and the milking herd size were increased over a two-year period. Fortunately, the farm was also able to attract a higher milk price, which because it was a local trend cannot be attributed to MDEP support. However, the net result has been that the farm has turned around from loss to profit and this is a credit to MDEP.

### 3.4.5 Comparison of resource efficiency with other dairy projects

#### **No significant finding**

We were asked to comment on the comparison between MDEP and other relevant projects in regard to resource efficiency and VfM. Two projects have been briefly reviewed from mid-term evaluation documents. Comments presented here about them are derived only from the viewpoints of their evaluators. It is impossible to compare the value for money of MDEP with the other two New Zealand dairy projects. They were both covered in mid-term evaluations and were thus too early to assess for VfM; in neither case was any attempt to assess VfM attempted by the evaluators; neither was data provided in those documents which could allow some assessment of VfM. However, some comment on resource efficiency is possible to the extent this is mentioned in evaluation documents.

The Columbia Dairy Value Chain Project (CDVCP) is valued at NZD 4 million and is being implemented from late 2015 for four years. The Philippines-New Zealand Dairy Project (PNZDP), which is valued at NZD 5.3 million, was scheduled for implementation from mid-2013 until mid-2018. The CDVCP is also managed by TAG and the PNZDP through the national government. Both projects use New Zealand advisers.

All three projects are intended to help to create profitable dairy industries and use New Zealand expertise. But unlike MDEP, the CDVCP and PNZDP are building capacity within existing dairy extension systems.

The Columbia and Myanmar projects are both dependent on technical assistance. Costs of advisers are high, but this is justified by the extensive economic gains that can be attained within the industry. The PNZDP, because it works through the National Dairy Authority and with its staff, seems to have had less international adviser input.

All three projects have been evaluated as having prudent financial management. The PNZDP was assessed as being under-spent by around 30% after 1.5 years, although this may not have proven to be a long-term problem. MDEP has modest under-expenditure which is not critical. The evaluation for CDVCP does not give specific data on expenditure against budget but noted that under-spending was possible. For both of the other projects, revisions of plans and budgets was recommended. This has already been achieved in MDEP. All three projects have been noted as lacking or partially lacking baseline information and seem to have had some difficulties with indicator setting and monitoring.

## 3.5 Sustainability

### 3.5.1 Sustainability of MDEP benefits

#### **Local ownership of MDEP benefits has been good, benefits are becoming sustainable but further support is needed to consolidate.**

Local ownership of MDEP's investments is good and engagement of stakeholders has been constructive. These are positive factors for the sustainability of benefits and good results for the four and a half years of MDEP's implementation. At the end of Phase 2, MDEP is contributing to the creation of a viable and sustainable industry with industry players increasingly grasping opportunities for improvement. A common understanding by industry and GoMy of how to grow the industry is emerging, based around sound production and quality principles. Expectations of ownership were not articulated in the ADD, but ownership is a pre-requisite for the attainment of

the project goal and its high-level outcomes. MDEP has helped to move the industry in the right direction.

Nucleus farmers and farmers from the larger focus farms are increasingly able to take risk and make new business investments, from which they will continue to benefit in the future. Smaller farmers, while they are constrained by access to funds, are showing willingness to invest in better farming practices as demonstrated by MDEP. Investments should continue to grow.

The provision of co-investment funds, as per the MDEP Facility Fund, is justifiable if it helps to address systemic constraints in the market. Co-investment should not pay for a private sector organisation's day to day operations or distort the market by providing undue benefit to a few players. For the Myanmar dairy industry, the underlying constraint has been aversion to investment risk and for the project period it has been appropriate to co-invest to overcome this. While there may be some priority co-investments for new innovations in the future, co-investment by its nature is not sustainable, as it is entirely dependent on donor funding. With gains in investment capacity evident as a result of MDEP, the design of any future NZ funded activity should consider reducing or phasing this out, while seeking to support further investment in other ways.

MDEP demonstrates that farm and forage management have been improved significantly. To a considerable degree, many participating farmers are showing ownership of better practices. There is still room for them to improve and they would benefit from ongoing support in the future to consolidate this. There remains a challenge to progressively expand these benefits to more farms. The price paid to farmers for their milk has been a challenge throughout the MDEP period and will continue to be so in the future. Reasons for this have been covered in 3.3.1. Additionally, households, i.e. small farms, have to balance a range of possible activities to get income, including paid labour elsewhere. If on balance they think their returns will be greater elsewhere, they will try to do this. MDEP has been able to demonstrate increased margins for milk through reducing cost of feed and labour, but particularly for small farmers, continued involvement in the industry will be dependent on returns.

The nucleus/focus farm approach is logical, is working well and is engendering a sense of common ownership among those participating. The MDEP approach depends on farmer to farmer learning to scale results. Economies of scale can be brought about by working on a system that mixes training through extension officers with engendering a farmer to farmer learning system. Both are required. This allows extension officers to reach more farmers. MDEP has not tracked numbers of people involved in farmer-to-farmer learning but reports that significant numbers of small farmers are visiting nucleus and some of the larger focus farms and taking advantage of the assistance they receive in this way. We observed farmer-to-farmer learning happening at a nucleus farm in Pyin Oo Lwin, and in Aug Ban with the discussion group. In both cases more advanced farmers from larger farms are acting as mentors. However, we do suggest that MDEP's approach in the milk quality area of producing standardised cartoon form material for display on farm walls, could usefully have been replicated to reinforce extension and farmer-to-farmer learning more widely. Additionally, several farmers have noted that they would welcome posters or other printed materials that present common extension and technical messages to farmers in their respective regions. MDEP has not done this to date, although we do note that different materials would be needed for different regions given climate, seasonality and other environmental differences.

Nucleus farmers are increasingly developing networks of smaller farmers along with their own capacity to collect and/or process milk. Strong multi-layer partnerships are being built and these are likely to continue to emerge. For a strong industry in the future, the approach needs to be

consolidated, more farms need to become involved and sustained work on cold chains is particularly required.

The extension system for dairy is not embedded or sustainably resourced (please see 3.3.2.4). This is a challenge for the future. Alternatives such as training graduates from the Yezin Animal Science course, people from nucleus farms and from supplier companies should be urgently examined. Farmer-to-farmer extension is starting to happen but still needs further support. The Greenway app approach noted above (3.3.2.1), which MDEP has embarked upon recently, also holds promise.

The impressive gains in milk quality brought about by MDEP and its partners will require more support in the future. The system would benefit from the adoption of a national milk quality standard, which to date the GoMy has been unable to approve. The LBVD testing system is operating well, and the laboratory has considerable ownership of it. However, it is currently dependent on MDEP to ensure that samples are regularly sent to the LBVD laboratory. There is a risk that, as the number of operations sending milk for testing increases, the laboratory's resources become stretched. A regime of full testing by nucleus farms and processors with LBVD audit or inspection would be more sustainable in the long term, and indeed MDEP would have liked this to have occurred earlier<sup>22</sup>. It bodes well that some larger operators have begun to invest in testing capacity, but this still needs encouragement. Overall, more work is needed to fully embed the milk testing system in Myanmar.

The sustainable supply of agricultural supplies and equipment for the Myanmar dairy industry is an ongoing challenge. The dairy industry is dependent on importing and will remain so for the foreseeable future. The overall agricultural sector is able to accept and cope with this and indeed, it is the norm. However, the challenge for the dairy industry is that until it becomes large enough to attract investment in distribution in Myanmar, supply of the inputs it needs will remain unreliable.

MDEP has provided supplies of seed and semen free of charge. This has been justified by the need to convince farmers to adopt new and improved genetics. However, this is clearly not sustainable. Farmers, particular at the smaller end of the industry, will need to be persuaded to pay for these inputs. MDA is working actively on the sustainable supply of imported seed. For its part, the project is making progress on encouraging a Myanmar agent to import forage seed on a regular basis and to distribute it through local outlets. Establishment of this system will take longer than the time currently available in MDEP Phase 2. While LBVD is producing local semen, if the adoption of the NZ breed is to continue, continued NZ financial support to distribute straws will be needed until the proof of concept stage for the NZ breed is reached. A co-financing arrangement could be examined to support this transition.

Sustainability of servicing and maintenance of farm equipment is a concern, although larger enterprises are more able to cope with this. Servicing of foreign sourced equipment is expensive as it often requires technicians to fly into Myanmar. There is little that MDEP can do about this in the time remaining, but it should be addressed in the future.

### 3.5.2 MDEP Exit Strategy

An exit strategy for MDEP was approved as part of the Phase 2 design and set the conditions under which it was considered MDEP would be able to "exit" (see Annex 5 which includes evaluation comments on the extent to which MDEP has met these conditions).

As a set of measures of achievement of expectations in the design, the exit strategy did identify some of the key elements of MDEP which would need to be completed to achieve the designed task.

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<sup>22</sup>. Refer Section 3.3.2.3 for more details.

However, there is no indication in the design that achievement of these expectations would lead to full sustainability and to fully meeting the goal of “a profitable and competitive Myanmar dairy industry, providing quality livelihoods for farmers, and safe food for consumers” and that therefore the industry would be able to continue to grow and prosper without further assistance.

### 3.5.3 Other sustainability issues

#### **Access to land and finance are ongoing constraints to sustainability**

There are two constraints to the industry’s development that MDEP has not been resourced to deal with and it has not attempted to do so; access to finance and to land. These are complex issues, which cannot be addressed through a sector-oriented activity like MDEP. For the future however, it would be useful to explore these constraints and opportunities.

Although larger farms and processors can access investment loans and funds, this is clearly a constraint for the smaller farmers, many of whom do not have bank accounts and are not financially literate. The key is not to provide funding, but to assist farmers to access it through financial institutions and schemes that already exist (noting for instance that the Rural Development Department of MoALI is active in this area) and to support farmers to be capable of accessing funding, through measures like financial literacy training. Some work on documenting this constraint and identifying possible options for the future would be very useful as a late Phase 2 activity.

Access to land is a major constraint, particularly for smaller farmers seeking to produce their own fresh fodder. Many are voicing this concern. A few have been able to gain access to new land, but most we have met have not been able to do so. The system for allocation of land for different agricultural purposes needs reform in Myanmar, but this is only one aspect of land rights and a land tenure system based on outmoded laws and regulations. Committees at local, regional and national level are working on this but progress is slow. In the remaining period of MDEP Phase 2, this constraint should be documented, noting what is being done and by whom, with a view to any future dairy industry activity being ready to assist farmers when and if reforms are made.

Availability and reliability of electricity is also simply noted as a constraint, albeit with Myanmar and international partners working to improve generation and supply, and with Myanmar’s hydro resource particularly promising. The domestic use of solar energy by rural communities is encouraging, but solar technology at this scale will not deliver cold chain solutions in the Myanmar context<sup>23</sup>, although private generators can of course assist.

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<sup>23</sup> We are informed by MDEP that solar units capable of chilling milk are available internationally but are too expensive to use for demonstration purposes (and thus to promote their use) in Myanmar.

### 3.6 A note on likely impact

While the terms of reference did not ask for a statement of impact, and the MDEP M&E system did not provide for impact analysis, the evaluation found several areas of potential/emerging impact that warrant discussion and which MFAT may wish to use in considering its future strategy in the Myanmar dairy industry.

There is evidence that MDEP is helping to improve incomes and work opportunities for farmers, which as part of the drive to reduce rural poverty, is clearly a priority for Myanmar. MDEP measures increases in margins for the farms and aggregate gains are impressive and if aggregated fully could be in the range of millions of dollars. This should be flowing through in terms of additional income available to farming families. Consolidation and continued support for the dairy industry in the future should help to cement gains in this area and bring a lasting impact. However, measurement of margins means there is no disaggregated data on impacts for women, men and youth.

MDEP is not able to measure increases in income for individuals and families, women, men and young people, involved in dairy farming. Firstly, although provision was made for a baseline survey in the early stages, no survey was conducted, which could have established basic data on dairy farming households and their incomes. This is outside the professional skill sets of MDEP's technical advisors, who have focused on raising capacities in dairy, and would have required a survey specialist and a data gathering team. Without a baseline, it is impossible to measure any increases in income through a second survey. However qualitative data, in the form of farmer accounts of how MDEP has helped, could be collected to show how more profitable farms are benefitting families in terms of what they can now pay for: better education and health services, better nutrition, transport etc. This could be used to make some assessment of the number of people who have benefitted from increased income through the work of MDEP.

We have argued above (3.4.4.2) for the inclusion of macro indicators on industry wide increases in investment and sales (i.e. across all parts of the dairy value chain) in addition to the measurement of margins for dairy farms. These would assist in measuring project impact on Myanmar as an economy, as well as in assessing the profitability of the industry. We have suggested that for investments, significant gains are being made. Given the low base of local raw milk production at MDEP inception, there has certainly been progress. While the milk price has remained low, the larger farms appear to be making higher profits. Careful management of labour and feed costs is bringing increased margins for all farms. If sustainability issues around farm practice, milk quality and the establishment of cold chains can be addressed, the impact of the dairy industry on the country's economy should continue to grow.

Consumer demand for milk is growing and is being met by local and imported milk products and the industry is taking up the challenge of improving milk quality, necessary to continue to raise demand. At this stage, the contribution of local milk to meeting demand is not accurately known. However, it should be possible to work with retailers to establish more accurate figures. While this is also an industry indicator it would also be a measure of how the industry is impacting on health, nutrition and food security. In the future, a better picture of who is buying milk and who is consuming and what preferences they have, would be of great value in assessing impact as well as in widening product diversity.

### 3.7 Cross-cutting Issues

#### 3.7.1 Gender and social inclusion

#### **Some inroads have been made in access to training by women. MDEP's gender and social inclusion outcomes are weak. Too little has been done, too late**

The MDEP design anticipated key analyses to ensure that gender and social issues were mainstreamed. These included a gender analysis to be undertaken in the first quarter and the integration of information relating to the roles of women and young people on dairy farms within farm baseline surveys, however neither of these were undertaken.

The design also anticipated gendered strategies including the creation of opportunities for women to participate in training; the inclusion of disaggregated data for all training and demonstration activities; for women's discussion groups to be included as part of MDEP work with farms; and special attention to be paid to women headed households or households where women take the lead role in dairy farming. Unfortunately, most of these have not been implemented.

As such, MDEP has largely been implemented in the absence of a gendered lens. Beyond these statements of intent, it is hard to see exactly how mainstreaming has been implemented and what the specific outcomes (either expected or unexpected, positive or negative) have been for women.

A brief case study was conducted in January 2016, based on a visit to Tapel village, but this was not a full gender and social inclusion analysis for MDEP. The study did make useful recommendations: for women taking the lead in identifying and addressing their own training needs; and for further analysis to consider barriers to their participation. Barriers noted included location and timing of training, and the need to find suitable entry points to maximise women's participation, with the view to balancing this with their other tasks. MDEP has used the case study in planning for women's training through the discussion group approach.

Unfortunately, this less than adequate application of a gendered approach is a characteristic of both Phases of MDEP. Acknowledging the gender gap, the Phase 1 Activity Completion Report reiterated the need for a full analysis, citing that "the MSC used the opportunity to learn more about Myanmar dairying before funding any intervention" and that "while women play an active role in the farm, almost always it is the men that receive the training." The report argued that results of the intended analysis should inform Phase 2 to increase accessibility through for example more in-village training, and shorter sessions that considered women's wider household and economic responsibilities. It appears that this analysis was not undertaken and the gender and social inclusion analysis for the Phase 2 design reflected that of the Phase 1 design; if nothing else a demonstration that little progress had been made in analysis.

Despite the lack of formal gender and social inclusion analysis and planning, MDEP has taken steps to strengthen the gendered approaches to training by incorporating information relevant to the needs of women in training, providing training opportunities in the villages to be held at times when women are able to attend and establishing targeted farm-based training for women.

However, participation alone is insufficient to claim effective gendered approaches and we have not been able to access proper documentation relating to the number of women, the topics covered and the training outcomes. The first Annual Report for Phase 2 noted that while women had been involved in training but that "(this) has not been institutionalised in the sense that this is an ongoing initiative". It seems that because of the high take-up at the time of project demonstrations and farm systems training (a noted success of MDEP) and the ensuing high demand on project adviser time,

the lack of specialist gender expertise, specific training for women was not delivered as per expectations.

#### **Village women working in dairy**

In Myae Ngu village near Mandalay, we were welcomed by the 25 women from the discussion group, which met regularly in the preceding 10 months. Through this approach the women have received training on fodder and silage production, animal feeding, artificial insemination, watering, calf, effluent and general farm management and milk quality. MDEP and LBVD have assisted them with a water tank and bamboo for fencing. Herd sizes are small, the cost of feed from outside is high and the village relies on milk collectors, who generally pay low prices. Nevertheless, the women remain active in dairy and have welcomed MDEP support to help turn around farm returns. The women told us that in their village they do the majority of the dairy work as their husbands are often away for other work. They have to balance family and farm needs in a busy daily schedule that includes feeding and caring for children. Sometimes they are able to get family or neighbours to help, but mostly the work rests with them.

Two of the twelve MDEP discussion groups specifically target women<sup>24</sup>. Facilitated by MDEP staff monthly, these groups combine training opportunities with discussion. The evaluation team met both groups and observed positive progress. They reported that they have gained technical knowledge in dairying which helps them to better manage their farms and improve practices. Men often don't share knowledge they have gained from training with women. MDEP however has not systematically used these opportunities to explore issues around women's role in the dairy chain and women's economic empowerment more generally, which is a lost opportunity.

MDEP reports that women farmers appear to be benefitting alongside men from increased profitability of their family farms, but we have not been able to access data which relates to how this change in income may be used at the household level.

In short, after considerable delays, MDEP has started to make some inroads in working with women in the dairy industry, however this appears to be in response to the need to address gender in some way rather than be informed by a gender analysis and strategy to more effectively support and enhance women's roles in the dairy value chain in Myanmar.

No specific interventions have been undertaken to address the needs of other segments of the community and/or vulnerable groups such as young people and people with disability.

#### 3.7.2 Environment

##### **MDEP is helping to put environmental safeguards in place in the dairy industry**

The main environmental issue that MDEP has worked on has been effluent management. Three large farms have effluent management systems meeting project standards and MDEP will meet its target of four such farms by the end of Phase 2. From our observations, MDEP has done more than this, given that a number of smaller farms are working on effluent management, including feeding effluent back into the growth of fodder, with profit benefits in returning manure to the pasture as the incentive. MDEP has also worked on the use of vermiculture. While MDEP is making progress, concerns over effluent from dairy is growing, particularly in peri-urban areas and effluent management will remain a challenge.

<sup>24</sup> Myae Ngu village near Mandalay and Pan Taw Sat Village near Meikthila



MDEP is collaborating with Massey University on the reduction of methane emissions from cattle. The project also recommends less use of concentrate in cattle feed, which is known to reduce methane. Some initial capacity building work has also been done with the FDA to support the development of laboratory staff capacity in micro-chemistry testing for pesticides, aflatoxins, mycotoxins and other agricultural residues.

### 3.7.3 Human Rights

Land tenure rights and access to land is noted as a major concern among dairy farmers. The constraints and challenges are very complex and a sector-oriented activity like MDEP cannot be expected to deal with them. Reform is needed to regulations around land use classifications and how dairy farmers access new land. However, this is beyond the scope of MDEP. However, there is space in the remaining time for MDEP to undertake preliminary work to document what is being done and by whom, with a view to any future dairy industry activity being ready to assist farmers when and if reforms are made.

We note that measures to help people with disability (PwD) were not called for in the design of MDEP and that no activities have been undertaken in this regard. To our knowledge, MDEP has not encountered any constraints around ethnicity in the implementation of its activities.

#### 4. Evaluation Conclusions

MDEP has been relevant to the needs of government and industry and fits well within MFAT's aid programme. MDEP has made significant progress in assisting Myanmar to create a viable and profitable dairy industry and impacts on income, work opportunities and consumer confidence and demand are anticipated. The market system for dairy products has been strengthened through New Zealand's investment and overall the investment has been good value for money. Expenditure has been within budget and appropriate to the design and to the needs of the industry.

Particular improvements have been made in dairy farming practice, with a well-chosen set of practices. Significant inroads have been made in improving the genetic stock of Myanmar's dairy cattle and more conclusive and documented results can be expected in 2019. The project has made major successes in the introduction and adoption of better animal feed. There is room for further improvement and expansion in these aspects in the future.

Progress towards milk quality as a result of MDEP has also been impressive, in terms of government capacity to test milk and farm and processor capacity to participate in testing and to improve the quality of their products. The capacity of Myanmar's largest milk retailer in milk handling has been improved. The company has established a good manufacturing practice system for processors from whom it buys. More work will be needed to fully sustain milk quality improvements. A better understanding of consumers and their preferences would be useful.

Multi-level partnerships among smaller and larger farms, processors and a major retailer have been created and ownership by industry partners of MDEP supported approaches and activities has been very good. Investment by industry players is growing, particularly recognising the nexus between production and quality and the growth of consumer confidence. Milk yield per animal has improved modestly but is expected to grow further in the future. More reliable input and equipment supplies will be needed in the future.

Capacity development for extension support to the industry has been a problem throughout the project's implementation and remains so for the future. With constraints to government resourcing of dairy extension apparent throughout Phases 1 and 2, extension work has mostly been carried out by MDEP advisers and a small core of government veterinarians. This has stretched the adviser and counterpart team and is not sustainable. Fresh approaches to dairy extension will be needed in the future. Very little progress has been made on creating a government strategy for supporting the dairy industry. It is up to the Myanmar Government to decide in the future what to do about this and ongoing technical support should only be provided where there is evidence that this is a priority and that the Government of Myanmar has the resources to take it forwards.

After early challenges, monitoring and evaluation capacity has improved within MDEP, particularly with the emergence of a clearer outcome structure. Overall reporting has been adequate, however more aggregate data on what is happening in the industry could have been collected. Any future New Zealand activity in dairy in Myanmar will need to address this. MDEP governance arrangements would have benefited from clearer definition of how decisions and recommendations were to be made.

The MDEP design anticipated a number of strategies to ensure that gender and social issues were mainstreamed in the delivery of the project, including a full gender analysis and the integration of information relating to the roles of women and young people on dairy farms within the farm baseline surveys. Neither of these were undertaken. Project implementation has largely been undertaken in the absence of a gendered lens and it is hard to see exactly how mainstreaming has been implemented and what the outcomes have been for women. However, MDEP has taken steps

to strengthen gendered approaches to training through women's discussion groups in farming villages. No specific interventions have been undertaken to address the needs of other segments of the community and/or vulnerable groups such as young people and people with disability.

MDEP is helping to put environmental safeguards in place in the dairy industry through work on effluent management and recommending less use of concentrate in cattle feed, which is known to reduce methane. It has undertaken some initial capacity building work with the Food and Drug Administration on laboratory staff capacity in micro-chemistry testing of agricultural residues.

## 5. Lessons Learned

Lessons that can be drawn from this evaluation and which can inform the development of future New Zealand support for Myanmar's dairy industry are:

### **Long-term nature of dairy industry development**

It was not assumed in design that industry-wide development would be completed in one project cycle. This evaluation supports that view. MDEP has been able to make significant inroads in farming systems practice and milk quality and has engendered investment by industry players. But it is very evident that the work is not yet complete. Hence a further project cycle for New Zealand support of Myanmar's dairy industry is the major recommendation of the evaluation.

### **An industry wide approach has been appropriate**

Approaches to development of a small, nascent but growing industry need to be across all areas of the value chain from production of fodder to purchase of a bottle of milk by the consumer. MDEP has attempted to intervene across the milk and milk product value chain. The initial design of MDEP called for an approach within the areas of production, processing and milk quality and successive iterations of design have more clearly articulated needs to work with retailers. These are all areas where needs have been clear, and where opportunities have existed. In short, work on them has been relevant to the industry. The project has been able to help the industry make significant progress in these areas, noting that further support is still required. MDEP has effectively focused on these areas throughout implementation. This has been an appropriate response to a growing dairy industry.

A more targeted approach, for instance starting only with milk quality, on the basis that quality can drive demand, supply and investment, would not have been logical without effort to improve production and processing. Cherry picking parts of the industry would not have been appropriate. Dairy industry development in Myanmar is recognised as a New Zealand niche and this also makes it appropriate to work across the industry.

MDEP has also focused on the complementary areas of extension and strategy development with GoMy and progress has been harder to achieve. The approach of New Zealand advisers and a small number of government counterparts to provide dairy extension is not sustainable but extension is nevertheless required for the future and it has been appropriate to work on this throughout the project period. Industry gains have been made despite the lack of government strategy and regulation development.

### **Need for ongoing market analysis and collection of aggregate industry data**

A major constraint to analysis of dairy as an emerging national industry in Myanmar is the scarcity of up-to-date industry data with which to inform an industry-wide, market systems view. Two market analysis reports were produced in 2014 and were contemporaneous with early MDEP Phase 1 implementation. At that stage, Myanmar's dairy industry was mainly geared to the production of sweetened condensed milk (SCM), albeit with SCM production in decline. An update is well overdue.

The FAO report "Dairy Value Chain Assessment for Yangon and Mandalay Region, Myanmar" was produced through The Asia Dairy Network. It provides a useful snapshot of the industry as it was in 2014, focusing on: milk consumers and their consumption patterns; milk producers and their

production systems, herds, breeds and feeds; and milk processors, their methods of collection and production and quality control.

The report “The Myanmar Dairy Sector: Status & Business Opportunities”, published by Wageningen University and Research in December 2014 takes a more market systems approach. It identified key constraints for the milk industry as including the cost price of milk, its quality, scarcity of land for dairy production, limited infrastructure (notably electricity), poor access to credit and shortage of skilled labour. The report called for dairy development on a geographical cluster basis utilising private public partnership approaches, the formulation of a national dairy strategy, the enhancement of research, development and training to suit and the creation of opportunities to learn about the value chain and identify strategic actions.

Our observations in-country suggest that these constraints still largely apply, and the report’s recommendations are largely valid. As presaged by Wageningen, what is still missing is a market systems analysis that clearly identifies roles and strategic options for the industry. MDEP had provision for a market systems analysis, but this was never produced. Regular attention to documenting industry progress and trends is very useful. Of note is the need to better understand who the milk and milk product consumers are and what preferences they have.

Coupled with ongoing analysis of the industry would be the collection of comprehensive aggregated data on how the industry is growing and developing over time. MDEP has collected a solid base of data on margins for farms. Similar data on investments and sales of all market players including input suppliers would be very useful in helping then industry to see where it is going and to help justify donor investment in the sector.

### **Scaling up and replication**

MDEP’s geographical focus around Mandalay, Yangon and Nay Pyi Taw has been appropriate to the existing and growing market for milk and milk products. It’s expansion into Northern and Southern Shan has responded to the suitability of these areas for milk production for the local market. The expansion into the area of Sagaing Region close to Mandalay has been logical. Clearly consolidation and scaling up within these areas to meet increasing milk demand is possible and should be the priority for the future if resources allow. LBVD would also like to see support for dairy development in other regions of Myanmar. Any future investment should proceed with caution in terms of replication in other areas of the country and would require solid industry analysis. A key constraint to geographical expansion of the milk industry is electricity supply for the maintenance of cold chains, with supplies non-existent in remoter areas and reliability a problem throughout the country<sup>25</sup>. This is also a constraint for expanding the consumer base, as many Myanmar citizens are not able to use refrigeration at home.

### **Quality as the key to increasing demand and supply**

Building a strategy for the milk industry around a “cycle of demand”, which was an underlying notion for the development of government strategy is useful. This states that increased quality brings increased consumer demand, which in turn encourages increased supply, which creates resource for investment, including in increased quality. This should be built into future investments in dairy in Myanmar.

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<sup>25</sup> Myanmar has a very low electrification rate, which it is improving with external support from (inter alia) the World Bank. According to the Myanmar Living Conditions Survey 2017 (Myanmar Central Statistical Organization), 42% of households have connection to the public grid; 85% and 25% respectively in urban and rural areas. The 2014 Wageningen report mentions Mandalay, Yangon, Nay Pyi Taw as having more reliable electricity supplies and to some extent smaller towns in Bago and Mandalay, regions en-route between Yangon and Mandalay. However, even the more reliably supplied areas are subject to extensive power outages. Many people do benefit from solar installations, but these are not suitable in the Myanmar context for cold chain purposes.

### **Clearer outcome focus during design and need for theory of change**

The three iterations of the MDEP results framework all have defined outcomes in their results measurement tables. However, the outputs and inputs, which come first in the tables, are not allocated against the outcomes which they are supposed to lead to, except through a summary diagram. It is hard to assess whether the many outputs defined for MDEP are sufficient to lead to the achievements of the outcomes that were intended. Aside from this making evaluation more difficult, this may have led to a focus on outputs and activities during implementation at the expense of maintaining outcomes as the primary guide. Reporting has tended to be focused on activities. Reports include several instances where activities have not been attempted or not completed. This does not add to the clarity of why the activity is justified or being attempted.

Instead it would have been useful to use a programme logic approach, developing a theory of change (ToC) for the initiative. A ToC forces the project to address issues of sufficiency through creating clear pathways of contribution to outcomes. It defines the goal and high-level outcomes that the activity aims to achieve and then works backwards to logically “identify all the conditions (outcomes) that must be in place (and how these relate to one another causally) for the goals to occur”<sup>26</sup>. These can then all be mapped out in the results framework. The ToC is thus a basis for defining what types of activity will lead to the achievement of outcomes. The links between activities and the outcomes and goal are more clearly understood. Importantly, programme logic or ToC is a critical tool for all stages of the programme cycle and should be reviewed regularly during implementation to test that the assumptions behind the design are still valid, if the anticipated changes are happening, and if they are not, changes can be made.

### **Early attention to baseline information**

Baseline data against which project progress could be assessed was not resourced. It was also not possible to do this during the earliest stages of MDEP implementation, when in the new context project approaches were being piloted. Estimates of baselines for indicators were made as part of the results framework for Phase 2, but comprehensive and rigorous baseline data has never been systematically collected. This requires inputs from survey design and data collection specialists and the training of survey data collection teams. Baseline data needs to be updated at least once during a project to assess progress over time (a mid-line) and ideally at the end of the project (end-line).

### **Resourcing M&E**

As a rule of thumb, development projects should be resourcing monitoring and evaluation at around five to 10% of total budget, not including donor costs for independent review and evaluation. With suitable monitoring staff on the ground (ideally local), this will allow for better and more accurate monitoring and reporting of achievements and challenges as they occur. This feeds back into project, partner and donor management decisions.

### **Planning for increased technical support**

Contingencies for Increasing the availability and inputs of technical advisers is ideally covered in project design, especially where it is known that if the project is successful, a growing number of industry players will bring increased demand on the services of advisers and their counterparts. This is linked with the availability of technical and extension support from government. A useful question at design is to ask what implications on adviser time requirements there would be if it is not possible

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<sup>26</sup> Center for Theory of Change website: <https://www.theoryofchange.org/what-is-theory-of-change/>

to fully develop the intended extension capacity. This is preferable to dealing with increasing demand after advisers have become stretched.

### **Function, definition and efficiency of governance arrangements**

Project governance structures should provide the opportunity for transparent stakeholder dialogue around successes and constraints and not just the presentation of progress reports for the previous period. The roles and functions of a project governance group should be clearly and succinctly defined at design, with updates documented when changes are made<sup>27</sup>. The membership should reflect the operating environment in which the project is implemented and the partnerships on which the project is built, providing articulation of a broad cross-section of views on project activities. If a governance group is empowered to make decisions (which appears to have not been the case in MDEP), these should be clearly documented. If major decisions have been made by management outside of the meeting format, members of the governance group should be appraised of them. Agendas and minutes should be prepared and distributed in a timely manner and opportunity provided for review of minutes at the commencement of each meeting. If resources are available, opportunities for governance group members to see project activities at first hand and to discuss them are very beneficial.

### **Realistic assumptions of government extension capacity**

Government departments involved in extension in aid funded agricultural activities rarely have sufficient funding to undertake everything they are charged with. This is an underlying constraint to development of fully functioning extension services. Donors are rightly reluctant to directly fund staff from recipient country government organisations. For future activities of this type alternative approaches will be needed. For dairying in Myanmar, while continuing to involve government in oversight, extension capacity could be built around directly hiring young extension staff using project funds and seeking ways of sustaining the capacity in the future, notably by getting industry to pay for it. Industry would need to be consulted at the start to develop a partnership approach for developing a sustainable dairy extension service.

### **Engaging a wider group of government agencies**

While the structures of the GoMy Ministries and Departments in Myanmar are necessarily being reformed at this stage, future project investment in the dairy industry could usefully consider the engagement of additional government agencies who might have a supporting role. These might include: the Planning, Agriculture, Land Management and Rural Development Departments of MoALI; and the Ministries of Finance and Planning, Education, Commerce and Industry.

### **Developing and implementing gender and social inclusion strategies**

Experience from development projects in a wide range of sectors, including agriculture, suggests that developing and implementing gender and social inclusion strategies requires specialist and planned efforts. The effort should start in the project design with gender analysis leading to clear strategies to attain gender and socially inclusion outcomes. Given the extent to which women are active in the dairy industry, a women's economic empowerment perspective is one useful starting point as is ensuring a gendered value chain analysis to identify what role women play in the dairy value chain and what interventions can be made to strengthen those roles and leverage outcomes for women. Effective gender and socially inclusive approaches do not necessarily mean a separate social inclusion component but rather fundamentally ensures that the different roles and needs of

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<sup>27</sup> This was done in designs for MDEP

women and men, and other groups in society are considered in the identification of strategies and setting of outcomes.

Getting gender and social inclusion right from the beginning is fundamental. Playing catch-up on gender and social inclusion, while common in projects where this has not been done, means retrofitting strategies that may not be responsive to gendered issues. Gender and social inclusion analysis should be undertaken as early as possible and integrate into strategy planning. Appropriate technical resources should be engaged to ensure attention to gender and social inclusion at all stages of the programme cycle”.



## 6. Recommendations

This report is accompanied by a separate document, which looks at options for the future of New Zealand support for the Myanmar dairy industry. This was developed in consultation with MFAT stakeholders after a workshop held in October 2018 and once completed will form one basis for MFAT's economic case for further investment in dairy in Myanmar. As a result, for this report, it is not appropriate to make detailed recommendations regarding future activities.

Rather we have provided one overarching recommendation regarding future investment, recommendations on priority activities that MDEP should undertake before completion in February 2019 and broad recommendations for the forthcoming design process.

### **Overarching recommendations:**

**New Zealand support to the dairy industry in Myanmar should continue beyond February 2019 and for continuity reasons should be scheduled to start as soon as possible after MDEP Phase 2 is completed.**

### **Recommendations on priorities till February 2019:**

Recognising that MDEP will not meet all targets for February, the project should as far as possible complete and document all activities it has remaining. The following are activities recommended for implementation prior to completion of the current phase to assist the design process:

- An updated industry market analysis including an initial assessment with Citi Mart of consumers and their preferences;
- An initial exploratory analysis of funding/loan mechanisms available to small dairy farmers;
- A brief synopsis of work and policy developments being undertaken to improve access to land for dairy farmers.

### **Broad recommendations for the design of a new activity:**

We recommend that a future New Zealand investment in Myanmar's dairy industry should:

- Ensure that a market systems analysis is included in the design;
- Consider fresh approaches to creating a dairy extension service;
- Clarify with the Government of Myanmar that a dairy development strategy is a priority and that there are resources available to take it forward;
- Consider engaging a wider range of government agencies in supporting dairy development;
- Consider reducing and/or phasing co-investment out, while seeking to support further investment in other ways;
- Utilise a programme logic / theory of change approach;
- Specify clear baseline and monitoring requirements and ensure that adequate budget is provided for these;
- Ensure a thorough analysis of gender and social inclusion aspects is included and clearly demonstrate how such priorities will be addressed, measured and funded; and
- Consider alternative approaches to technical assistance and contingencies in design to allow scale up of technical assistance as the industry grows.

Annex 1: Evaluation analytical framework

The following table is taken from the Evaluation Plan and shows the analytical framework and lines of enquiry used for this evaluation.

Analytical Framework	Lines of enquiry
<b>Relevance: Assess the relevance of MDEP</b>	
<p>Our measurement of relevance takes into account the extent to which:</p> <ul style="list-style-type: none"> <li>* MDEP intention and design are aligned with Governments of Myanmar and New Zealand policy priorities;</li> <li>* MDEP intention and design are aligned with the priorities of MFAT’s implementing partners and the wider stakeholder group;</li> <li>* MDEP intention and design are aligned with the delivery context; and</li> <li>* MDEP implementation is consistent with intended goals and objectives.</li> </ul>	<ul style="list-style-type: none"> <li>* To what extent are programme goals, objectives and outcomes aligned with MFAT policies and New Zealand Government priorities for development assistance? Are there any conflicts? Are there any gaps?</li> <li>* To what extent are programme goals, objectives and outcomes aligned to Government of Myanmar development priorities and priorities for development assistance? Are there any conflicts or gaps?</li> <li>* To what extent are programme goals, objectives and outcomes aligned to other partner missions and core businesses who are working in various ways along the value chain? Are there any conflicts or gaps? Is MFAT working with the right partners?</li> <li>* Are MDEP implementation arrangements sufficiently flexible to respond or adapt to changing development priorities? What changes have occurred during the five years since design in (inter alia) the Governments of Myanmar and New Zealand, the agriculture sector in Myanmar, and business confidence among dairy industry players How has MDEP coped with these changes in its development and operating environment and has this been appropriate.</li> <li>* As per principles articulated in Myanmar’s agricultural strategy for 2018-2023, to what extent is MDEP able to: clearly define public and private sector roles within the emerging dairy industry; and offer insights into improvement of smallholder farmer rights and voice and the position of smallholder farmers as drivers of growth?</li> </ul>
<b>Effectiveness: Assess the effectiveness of MDEP in delivering programme outputs and outcomes</b>	
<p>Our measurement of effectiveness takes into account the following issues:</p> <ul style="list-style-type: none"> <li>* The extent to which MDEP has achieved programme outputs and progress towards intended outcomes?</li> </ul>	<ul style="list-style-type: none"> <li>* What outcomes are being achieved by MDEP and its partners? What capabilities have been built?</li> <li>* How valuable have MDEP’s achievements been? For whom? Has the impact of</li> </ul>

Analytical Framework	Lines of enquiry
<ul style="list-style-type: none"> <li>* How and in what ways have MDEP design components and implementation methodology (e.g. commercial value chain strengthening model) contributed to MDEP achievements?</li> <li>* What opportunities have there been to collaborate with other donors?</li> <li>* What have been key facilitators and barriers for MDEP achievements? What has/has not worked well and why/why not?</li> <li>* Have there been any unintended outcomes? E.g. Has there been any impact on the environment? If so, how has this been addressed?</li> <li>* The extent to which cross-cutting issues (Environment, Human Rights and Gender Equality) been effectively integrated in MDEP design and delivery?</li> </ul>	<p>interventions been even amongst members within each beneficiary group and with market actors along the value chain? Or have some been more greatly impacted than others? Why or why not?</p> <ul style="list-style-type: none"> <li>* How are the different stakeholders benefitting from investments/outcomes? Who are the winners and losers along the value chain?</li> <li>* What approaches are being used effectively? What has worked well?</li> <li>* What programming challenges exist and how are they being addressed? What barriers have been encountered? What has not worked well?</li> <li>* What benefits or challenges have emerged that were not anticipated originally?</li> <li>* How appropriate and responsive to the design of both phases of the project has MDEP been as it has been implemented? How accurate were the assumptions made in design when compared to the actual operating environment as encountered by MDEP.</li> <li>* Has MDEP established effective partnerships with key stakeholders operating within the value chain to achieve its intended outcomes? Is the partnership model supporting the achievement of outcomes?</li> <li>* How is MDEP fitting with other relevant/related New Zealand or other donor agency projects and initiatives? How effective has such collaboration been? Is the “total more than the sum of the parts”? What have been the benefits? To what extent has MDEP has integrated with other MFAT projects in Myanmar including MITA, NZ Aid Scholarships and Short-term training awards</li> <li>* To what extent has the capacity of LBVD extension staff been improved as a result of MDEP support and how is this currently being measured? What has been the result of involvement of private sector extension agents and has MDEP been able to assist in their capacity development? What skills, knowledge and capacity have been attained by these groups?</li> </ul>

Analytical Framework	Lines of enquiry
	<ul style="list-style-type: none"> <li>* Has the choice of geographical locations/territories served by MDEP been adequate and representative of dairy industry needs to date?</li> <li>* What tangible results and improvements have been made in animal welfare and health as a result of MDEP and how have these contributed to the attainment of planned MDEP outputs and outcomes?</li> <li>* To what extent are different stakeholders included in and benefitting from the project e.g. people with disability (PwD), women, young people?</li> </ul>
<b>Efficiency: Assess the efficiency of MDEP</b>	
<p>Our assessment of efficiency takes into account the extent to which:</p> <ul style="list-style-type: none"> <li>* MDEP management and governance have been efficient. Including: delivery through a MSC; MFAT’s contract management and oversight; and monitoring and evaluation arrangements to deliver clear evidence of programme results and inform adaptive management.</li> <li>* MDEP has successfully worked with partners, private sector organisations and the Myanmar Government Extension Service and others (e.g. linkages with relevant New Zealand and Myanmar organisations).</li> <li>* MDEP has delivered value for money (VfM). Including: delivery through a Management services Contractor; deployment of programme resource (e.g. balance of technical assistance, infrastructure and hardware). Why was the current implementation methodology selected? Were the assumptions on which this was based correct? If any changes were made, what were the results, and did they enhance VfM?</li> </ul>	<ul style="list-style-type: none"> <li>* What role does each actor play in the delivery of MDEP? Are there other things that the partners should/could be contributing?</li> <li>* How has MDEP been managed since inception? What contributions/involvement have the supplier and MFAT made to this? How has this activity succeeded relative to other relevant donor projects of similar size with respect to resource efficiency? Have management contributions resulted in a more effective project. What has been the quality of project and financial management and reporting and correspondence.</li> <li>* Has MFAT’s overall management of MDEP been flexible to allow changes and adaptations as the work of the project progresses and needs emerge?</li> <li>* Have project management and governance systems been similarly flexible in response to change?</li> <li>* How has the creation of a Technical Advisory Group (TAG) improved governance of MDEP? How has the TAG related, contributed and added value to the work of the New Zealand Dairy Activity Governance Group? How has the TAG helped MDEP learning, improvement and communication with farmers?</li> <li>* What factors impact the capacity and</li> </ul>

Analytical Framework	Lines of enquiry
	<p>capability to effectively, efficiently and sustainably deliver the intended results?</p> <ul style="list-style-type: none"> <li>* What resources (financial and human resources) are available? Were these appropriate and sufficient to support the goals, objectives and activities of MDEP?</li> <li>* Noting that this was a phase 1 issue, to what extent have project personnel resources, international or local, been sufficient during phase 2 to meet industry needs and demands for MDEP services? Has the mix of personnel deployed been correct for MDEP purposes? Is there any area of expertise that has been missing? How resource intensive in terms of time available have adviser inputs been throughout the two phases?</li> <li>* Did the model represent the best use of resources to deliver the intended outcomes? Has it resulted in Value for Money in MDEP? How does MDEP VfM compare with that of other MFAT dairy projects that have been evaluated?</li> <li>* Were efficient management processes in place to coordinate and manage partnerships? Are business processes proportionate to the investment and the needs of players along the value chain? How do partners manage risk? Are effective communications systems in place?</li> <li>* To what extent have MDEP M&amp;E and reporting capacities improved as Phase 2 has progressed? In a broad sense does the project adequately report against the agreed Result Measurement Table? Are all required milestones being delivered in a timely manner and to required standards?</li> <li>* Is the M&amp;E/Results Framework for MDEP linked to MFAT performance and communications frameworks?</li> <li>* Is MDEP collecting the right mix of data and evidence (considering a quantitative/</li> </ul>

Analytical Framework	Lines of enquiry
	<p>qualitative mix).</p> <ul style="list-style-type: none"> <li>* Does reporting meet MFAT information needs? Are reporting mechanisms sufficient or over burdensome?</li> <li>* Of all equipment, machinery and supplies purchased for MDEP, what percentages by type have been purchased with New Zealand funds (and therefore what percentage by local stakeholders)? What does this imply for the future?</li> <li>* What has been the MDEP experience of responding to demands from new entrants to the dairy industry (at whatever stage in the value chain) or those who have not previously received project assistance?</li> </ul>
<b>Sustainability: Assess the sustainability of MDEP</b>	
<p>Our assessment of sustainability takes into account the following issues:</p> <ul style="list-style-type: none"> <li>* Which MDEP outputs and achievements will be sustainable in the longer term and to what extent?</li> <li>* What factors are enhancing or constraining sustainability?</li> <li>* To what extent is local confidence developing in MDEP's outputs and approach?</li> </ul>	<ul style="list-style-type: none"> <li>* Is there evidence that beneficiaries involved in MDEP will continue to reap the benefits of MDEP supported initiatives beyond the funding period?</li> <li>* Is there local ownership over MDEP investments and are all relevant stakeholders engaged? To what extent has local ownership been built through MDEP and is this commensurate with expectations of almost five years implementation experience or with expectations as articulated in design.</li> <li>* How does MDEP meet increased demand for assistance from farmers and others when this occurs? If there are resourcing constraints to scale-up in the future, how might they be overcome and how could such assistance be made more sustainable?</li> <li>* To what extent are participating farmers and farmer groups able to access finance/credit to fund new or upgraded dairy investments? To what extent are they now able to meet future investment needs?</li> <li>* Are participating farms able to handle future requirements for servicing and maintenance of dairy equipment in which they have invested?</li> <li>* To what extent is Myanmar currently dependent on imported supplies and</li> </ul>

Analytical Framework	Lines of enquiry
	<p>equipment/machinery for its dairy industry? To what extent is current reliance likely to be continued and acceptable in the future? In particular, to what extent are imported seed and semen supplies sustainable in the future and what measures have been taken in the current phase to engender local supplies? Are there any barriers to importing e.g. tariffs, regulations etc. that have been hard to navigate?</p> <ul style="list-style-type: none"> <li>* To what extent have farm management and farm data recording skills been adopted and practiced in participating farms? To what extent are extension officers able to assist farms to gain these skills?</li> <li>* How does data get used within MDEP to provide evidence for and to drive change? Is this currently dependent on International Advisors, and if so how might this dependency be reduced in the future?</li> <li>* What is the MDEP exit strategy? Is it clear?</li> </ul>
<p><b>Impact: No specific objective provided in the TOR. We suggest: to the extent possible during implementation, assess the likely impact of MDEP over its two phases</b></p>	
<p>Our assessment of impact takes into account the following issues:</p> <ul style="list-style-type: none"> <li>* The extent to which the Myanmar dairy industry is competitive and profitable:</li> <li>* The extent to which MDEP has helped farmers to attain quality livelihoods;</li> <li>* The extent to which MDEP has added to the safety of food available to Myanmar citizens.</li> </ul>	<ul style="list-style-type: none"> <li>* To what extent has MDEP made improvements to the incomes or work opportunities of women, men and youth and how is information on this measured? To what extent has MDEP been able to influence women’s decision making in the smallholder dairy sector?</li> <li>* To what extent has MDEP helped to create a vibrant, sustainable, competitive and profitable dairy industry? How are these factors currently measured?</li> <li>* How much has consumer demand for milk and milk products grown in the period of MDEP’s two phases? How is this being measured? What has been learned about consumer preference and how this might be changing?</li> <li>* How much has MDEP been able to do to bring about milk and milk product standards and sustainable management of quality and safety?</li> </ul>
<p><b>Lessons learned: No specific objective provided in the TOR. We suggest: document to the extent possible the lessons learned from implementation of MDEP Phases 1 and 2</b></p>	
<p>Our work on lessons learned will take into account the following issues:</p>	<p>The team will be responsive to suggestions as to lessons learned. Inter-alia we will ask:</p>

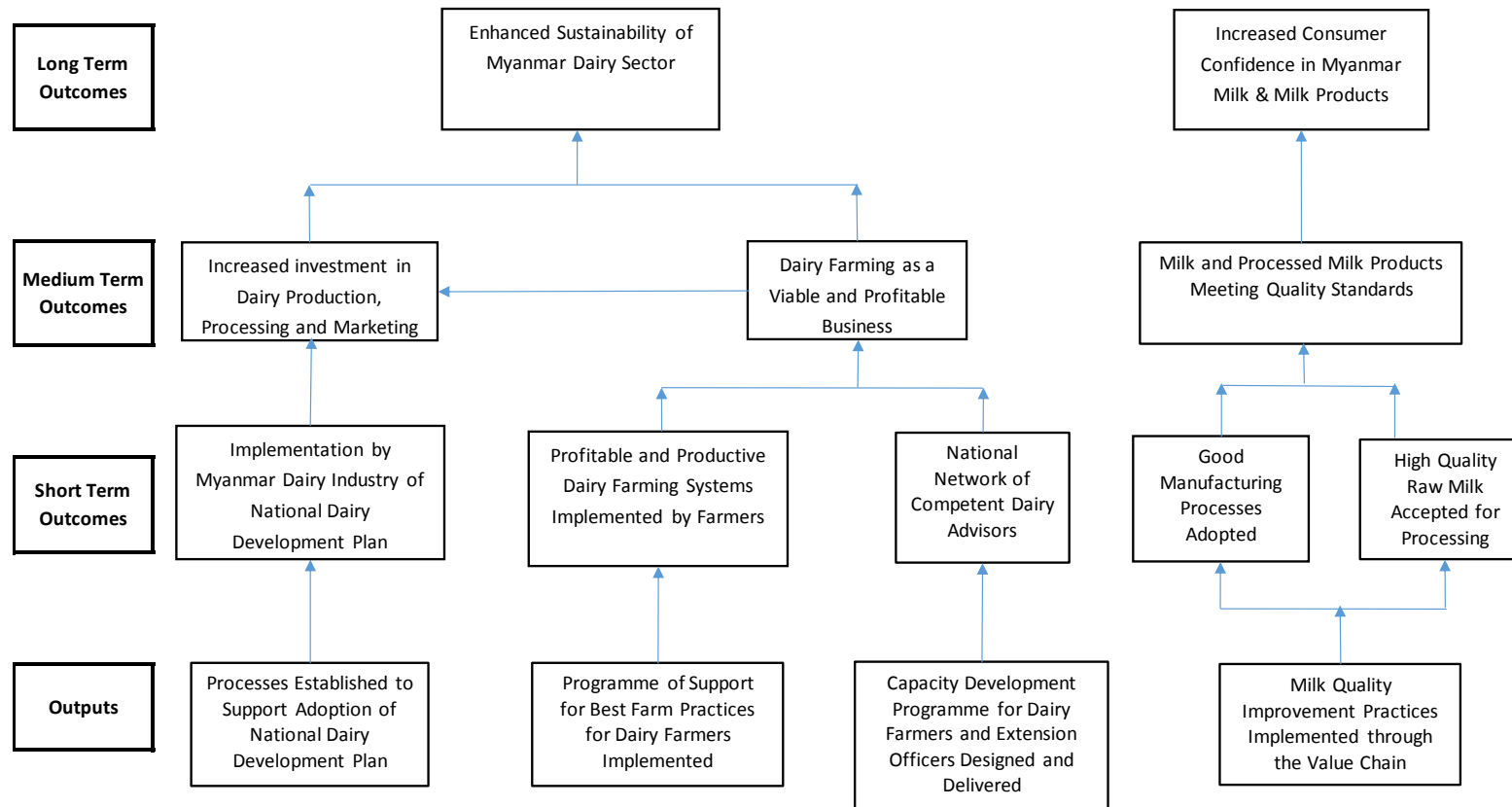
Analytical Framework	Lines of enquiry
<ul style="list-style-type: none"> <li>* What lessons can be identified to improve relevance, effectiveness, efficiency and sustainability for New Zealand’s support of dairy development in Myanmar?</li> <li>* What future opportunities exist to build on or expand New Zealand’s support for the Myanmar dairy value chain? Including: most impactful areas of MDEP March 2014 - February 2018 (August 2018?); what are the key factors that may enhance or constrain scalability; aspects of the value chain that would benefit from the provision of ongoing or additional technical support or resources in future; new or emerging market development opportunities that will enhance opportunities for farmers to benefit from a stronger dairy value chain; new partners including private sector and collaboration opportunities with other donors.</li> <li>* What are the current or likely constraints, institutional barriers or market weakness that may constrain the impact of future support?</li> </ul>	<ul style="list-style-type: none"> <li>* What have been the constraints around the completion and adoption of the National Dairy Development Strategy and what can be learned from this experience? What has been the government institutional requirement for the development of the Strategy and its response to assistance provided by MDEP? Has MDEP been requested and able to assist with LBVD’s shorter term planning needs?</li> <li>* What would be a balanced approach to government/private extension support in future dairy activities?</li> <li>* How would a future initiative look at scaling-up and replication of the benefits of MDEP and what priorities might be appropriate, given limited resources? Which geographical areas of Myanmar may be appropriate?</li> <li>* To what extent can data from farms participating in MDEP at present be considered as representative of the industry for planning purposes for any scale up or replication of MDEP?</li> <li>* Has MDEP been able to bring about any changes in Myanmar’s systems for veterinarian training and livestock research? What has been done, what has been learned and what could be done in the future?</li> <li>* Have specific lessons been learned about how women and other marginalised groups can benefit for an investment of this type?</li> </ul>
<p><b>Cross Cutting Issues.</b> Is a subset of Effectiveness responding to Question 6 under Objective 2</p>	
<ul style="list-style-type: none"> <li>* Our assessment of cross cutting issues considers the extent to which cross-cutting issues (Environment, Human Rights and Gender Equality) have been effectively integrated in MDEP design and delivery?</li> </ul>	<ul style="list-style-type: none"> <li>* Did the design demonstrate meaningful consideration of Gender Equality, Human Rights and the Environment? To what extent were these considerations carried through to implementation?</li> <li>* Does the intervention have a clear strategy for targeting and creating benefit to women (e.g. has the investment considered the role of women in the value chain, has a gender analysis been undertaken?).</li> <li>* To what extent are women and men differently benefiting as industry players from the investment? Is the investment able to provide evidence of gender</li> </ul>



Analytical Framework	Lines of enquiry
	<p>outcomes?</p> <ul style="list-style-type: none"> <li>* How have human rights considerations been addressed at implementation? Who is benefitting from the programme and who is not (e.g. ethnic minorities, women, people living with disability)? Have specific groups been excluded from the programme.</li> <li>* Are there specific safeguards in place to ensure the protection of children (including child labour), human security?</li> <li>* To what extent has the programme put environmental safeguards into place.</li> </ul>

Annex 2: MDEP December 2017 Results Measurement Framework

**Goal: A Profitable and Competitive Myanmar Dairy Industry Providing Quality Livelihoods for Farmers and Safe Food for Consumers**



Annex 3: Comparison of MDEP's three results frameworks

Phase 1 framework	Phase 2 framework	December 2017 revised framework
<b>Long-term outcomes</b>		
Expanded and Competitive Dairy	Enhanced sustainability of the Myanmar dairy sector	Enhanced sustainability of the Myanmar dairy sector
Improved Health and Welfare of Myanmar citizens	Increased consumer confidence in Myanmar milk and milk products	Increased consumer confidence in Myanmar milk and milk products
<b>Medium-term outcomes</b>		
Dairy farming as a Viable and Profitable Business	Dairy Farming as a Viable and Profitable Business	Dairy Farming as a Viable and Profitable Business
Increased Investment in Dairy Production, Processing and Marketing	Increased Investment in Dairy Production, Processing and Marketing	Increased Investment in Dairy Production, Processing and Marketing
Improved Nutrition through Increased Consumption of Milk and Milk Products	Milk and Processed Milk Products Meeting Quality Standard  Increased Shelf Life of Myanmar Milk Products	Milk and Processed Milk Products Meeting Quality Standard
<b>Short-term outcomes</b>		
Improved Policy and Regulatory Environment	Ownership by Myanmar Dairy Industry of National Dairy Development Plan  Network of Farms achieving higher milk yields and lower production costs	Implementation by Myanmar dairy industry of National Dairy Development Plan  Profitable and productive dairy farming systems implemented by farmers
Improved Milk Yields and Lower Costs of Production per litre of Milk Produced	Good Manufacturing Processes Adopted	Good manufacturing processes adopted
Milk and Processed Milk Products meeting Quality Standards	High quality Raw Milk accepted for processing	High quality raw milk accepted for processing

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

Phase 1 framework	Phase 2 framework	December 2017 revised framework
Milk Volumes and Processed Milk Products Aligned with Market Demand	National network of competent dairy advisors	National network of competent dairy advisors
Outputs		
<b>Strategy</b>		
National Dairy Development Plan Completed	Processes established to support adoption of National Dairy Plan	Processes established to support adoption of National Dairy Plan
Priority Regulations and Protocols Approved & Applied		
Market Analysis Reported		
<b>Practice</b>		
Improved Forages Introduced & Established	Profitable and productive dairy farming systems demonstrated	Programme of Support for Best Farm Practices for Dairy Farmers Implemented
Cost Effective Diets Developed for Improved Dairy Performance		
Improved Dairy Breeding Programme & Animal Welfare Established		
<b>Capacity</b>		
Farmer & Service Provider Capacity Development Programme Implemented	Capacity Development Programme for dairy farmers and extension officers designed and delivered	Capacity Development Programme for dairy farmers and extension officers designed and delivered
<b>Quality</b>		

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

Phase 1 framework	Phase 2 framework	December 2017 revised framework
Improved On-Farm Milk Quality & Waste Management Systems Delivered	Milk Quality Improvement Practices implemented through the value chain	Milk Quality Improvement Practices implemented through the value chain
Improved Processing Quality and Product Diversity Programme Developed		

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

Annex 4: Results Recorded to February 2018

December 2017 design outcome	Indicator	Summary of project reporting February 2018	Evaluation comment	Likelihood of target achievement by February 2019
<b>Long-term Outcomes</b>				
<b>1. Enhanced Sustainability of Myanmar Dairy Sector</b>	Number of new dairy farms in Myanmar (locally and internationally funded) that are increasing the contribution to milk delivered to processors	MDEP currently working with: 5 Farms 100+ cows 5 Farms 50–100 cows 272 Farms 1-50 cows Evidence of growth already available. Ahead of Schedule.	This is intended to show how supply of milk is increasing in Myanmar and is a surrogate for increased contribution of milk indicator that assumes that all cows in all farms that MDEP is working with are producing milk that gets passed through processors. As we found in Aung Ban, not all farmers sell their milk to processors. And not all cows in all farms are producing milk – heifers and pregnant cows are presumably included in the figures provided. It is clear from observations and discussions and from looking at MDEP’s datasheet that milk production per cow per day is increasing.	The targets for February 2019 are: At least 10 farms with herds of 100+ cows, 15 farms with herds of 50-100 cows and 300 farms with 1-50 cows. None of these targets were achieved at the time of the last annual report, although the target for small farms was almost achieved ahead of schedule. Latest datasheet information suggests that milk production has increased by some 14% during the period of the project, to the extent that MDEP monitors through the farms it is most closely associated with. It is difficult to see how overall local milk supply in Myanmar can be more accurately estimated. It is likely that MDEP will reach the agreed February 2019 targets for medium sized farms and be close to that for large farms.
<b>2. Increased Consumer Confidence in Myanmar Milk &amp; Milk Products</b>	Percentage growth in sales of local fresh milk and milk products per annum through approved supplier schemes	City Mart have advised 28% growth in demand for fresh, local, processed milk over the 2017 calendar year, that was driven by increased consumer confidence. Citi Mart has gone from customer returns and complaints every week, to none over the past 12 months. Achieved.	This is intended to show how demand for milk and milk products is changing and we suggest this is showing impressive results, notwithstanding the comment on the indicator to the right. Updated Citi Mart figures we were given show that overall milk sales (including UHT, powdered milk etc. and local and imported milk) have increased by approximately 25% in the year to July 2018. MDEP’s	The target is to see an increase in sales of local fresh milk and milk products of 10% over the baseline. However, the baseline has not been established. Furthermore, MDEP is able to report on fresh, local, processed milk, but not on all milk products. This indicator and the February 2019 target are currently, strictly speaking, unmeasurable. This is regrettable, given that demand for milk and milk products is clearly

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

December 2017 design outcome	Indicator	Summary of project reporting February 2018	Evaluation comment	Likelihood of target achievement by February 2019
			assessment for fresh, local, processed milk is of the same order. Clearly, milk demand is increasing significantly. In fact, there have been 6 milk consumer complaints so far in 2018, compared with 134 in 2017. Progress since 2017 in reduction of complaints has been impressive.	increasing along with consumer confidence. However, if this can be clarified, we think that in reality, MDEP will have achieved very well by February 2019.
<b>Medium-term Outcomes</b>				
<b>1. Increased Investment in Dairy Production and Processing</b>	Percentage of Nucleus and Focus Farmers who have invested in at least two of: <ul style="list-style-type: none"> <li>• Increased Fodder Establishment</li> <li>• Increased size of herds</li> <li>• Farm infrastructure</li> <li>• Processing capacity</li> </ul>	33% of the 83 closely monitored focus and nucleus farms achieving target of investing in 2 of the opportunities. 65% have invested in one of the opportunities. Ongoing.	We are unable to comment on the figure given of some 27 to 28 from the 83 closely monitored farms investing but have no reason to doubt MDEP's assessment. On field visits we saw a range of investments made by farmers in growing fodder, increasing herd sizes, farm infrastructure, particularly sheds and in some case, processing capacity <sup>28</sup> . In our discussion with MDEP staff we heard that 4 major farms have between them invested some USD 2.1 million (NZD 3.2 million) in production and processing. While this has not been independently verified by us, it does provide an indication of the kind of returns that can be made. MDEP is commended for this.	This target is 80% for February 2019. This may be met <sup>29</sup> .
<b>2. Dairy Farming as a Viable and Profitable Business</b>	Percentage of dairy farms having annual income that exceeds annual feed and labour costs (i.e. positive Gross Margin)	Intensively monitored sample of 83 shows 87% with positive Gross Margin (margin over feed and labour). In addition, the Gross Margin has increased. The average	Project data from February 2018 includes a calculation for nearly 60 of the monitored farms of "margin over feed and labour – MOFAL" – a measure of gross margin. Later	The target is 90% of monitored farms having positive gross margin. Given figures provided by MDEP, this target is likely to be achieved.

<sup>28</sup> The MDEP Facility Fund has contributed agreed percentages for some investments. Please refer to (3.4.3.3) for further details.

<sup>29</sup> Note that we suggest that an indicator of aggregate monetary value of investments would have been useful – please refer to Section 3.4.3.4 on value for money for further details. We also understand that increasing investments are tangible evidence of increased confidence by farmers and processors in their industry.

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

December 2017 design outcome	Indicator	Summary of project reporting February 2018	Evaluation comment	Likelihood of target achievement by February 2019
		<p>gross margin per month has increased from \$1,041 at the start of involvement with MDEP, to \$1,774 at the end of March 2018. Ahead of Schedule.</p>	<p>versions of this datasheet have yet to include this calculation and project calculations as at end March 2018 seem to have been made for the full 83 closely monitored farms. However, the figures given to the left for end March are credible. We have calculated the most recent increase in the August 2017 to February 2018 period to be \$680.</p>	
<p><b>3. Milk and Processed Milk Products Meeting Quality Standards</b></p>	<p>1] Percentage of fresh milk products from Nucleus Supply processors consistently meeting approved milk quality standards.</p> <p>[</p> <p>2] Number of days shelf life of Myanmar milk products accepted at</p>	<p>Pasteurised milk samples submitted monthly by the 31 processors show that 87% meet SPC standard and 78% meet E. Coli standard. <b>Target exceeded.</b></p> <p>Yoghurt samples submitted show 57% passing E. Coli and 39% passing yeast and mould tests. Quality has declined over the year.</p> <p>Reflects increased testing and increased submissions. Ongoing.</p> <p><b>Partially Completed.</b></p> <p>One processor now achieving this but with an alternate retail outlet.</p>	<p>All processors involved with MDEP are now having samples tested. Figures provided to us by the LBVD Laboratory, Mandalay show a broader picture. The lab has given figures on evaluation of overall milk quality over the period of the project – from 2014 to this year to date and not specifically for SPC or E. Coli. For pasteurised milk 35% of samples were acceptable in 2015; 73% this year. For yoghurt, 23% were acceptable in 2015; 45% this year. For raw milk, 19% was acceptable in 2015 and 44% this year. MDEP’s report is correct to say that the volume of testing has increased; LBVD data confirms this, and we note that MDEP has played a significant part in equipping, training and supporting the lab in this work. MDEP’s assessment against this indicator has more detailed data from the lab and is considered accurate.</p> <p>We only met one retailer group, Citi Mart. They are still using a shelf life</p>	<p>The target is for 75% of the 35 processors to meet quality standards by February 2019. In the case of pasteurised milk, this target has been reached and should be maintained until March 2019. For yoghurt the target of 75% may not be achieved. We note that significant progress is occurring in this area, but that among processors contributing samples consistency across successive samples is still an issue.</p> <p>The target for shelf life is 10 days for</p>



MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

December 2017 design outcome	Indicator	Summary of project reporting February 2018	Evaluation comment	Likelihood of target achievement by February 2019
	CityMart Holdings	Labelling has not changed. Approved Supplier Scheme not fully implemented. Tests show this can be achieved. <b>Partially Completed.</b>	of 4 days, after which a sale or return policy is invoked – however given rising demand, there is reportedly little milk to return after 4 days. Our observations in an Ocean supermarket show that labelling is still an issue. Citi Mart does now have its approved supplier scheme up and running and has benefitted from MDEP training in Yangon for its own internal milk handling procedures. Another useful indicator, not recognised at the time the latest RMT was agreed, is that milk consumer complaints have decreased over the last year from 134 in 2017 to only 6 so far this year.	February 2019. It is not guaranteed that Citi Mart will increase shelf life by February 2019.
<b>Short-term Outcomes</b>				
<b>1. Implementation by Myanmar dairy industry of National Dairy Development Plan</b>	National Dairy Development Plan for Myanmar in place and implemented.	LBVD and the NDDB reviewed the draft NDDP that had been provided by MDEP, and while in general agreement with the strategies within the document, believed that they needed a more operational, short-term plan to guide their day-to-day planning. LBVD has added short term tactical targets to the draft NDDP, but this has yet to be endorsed by NDDB. The National Dairy Development Board is not using the Plan and appears to continue to be ineffective in leading the industry.	The NDDP is effectively stalled pending Ministerial approval. The NDDB exists but is not effective.	The adoption and implementation of the NDDP will not have been achieved. The NDDB will not be effective by the end of MDEP Phase 2.
<b>2. Profitable and productive dairy farming systems implemented by</b>		MDEP has extensively reported on this outcome. Highlights include:		

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

December 2017 design outcome	Indicator	Summary of project reporting February 2018	Evaluation comment	Likelihood of target achievement by February 2019
<b>farmers</b>	[1] Percentage of dairy farms actively implementing at least six 'best practices' that have been demonstrated to them in extension activities <sup>30</sup> .	25% of the 83 farms closely monitored are demonstrating 6 out of 8 best practices as demonstrated to them through MDEP extension activities. All are achieving 4 out of 8.	From a limited number of observations and through discussions, we concur that this is a reasonable conclusion to make. This is one of the areas in which MDEP has achieved very good results.	MDEP may achieve its target of 60% of the 83 farms demonstrating 6 out the 8 practices, although this will require continued effort.
	[2] Number of farmers adopting improved effluent management systems.	3 farms are currently implementing effluent management control which meet MDEP standards.	We are satisfied that this is happening. We see evidence from farm visits that awareness of the need to address this environmental issue is growing.	MDEP will very likely achieve the target of 4 farms with effluent management meeting project standards.
	[3] Milk yield.	Milk yield has increased from an average 8.8 litres per cow per day to 9.3 litres per cow per day at the end of the year. Within the monitored group there are farmers exceeding 12 litres per day. It is unlikely that the average milk production will increase to 12 litres per cow per day over the next 12 months, across all farms, given the state of the current cows, and the time frame available.	Farmers and processors have spoken of increase milk yields. At this stage, this is as a result of considerable project attention on forage, feed management and nutrition. We have reviewed MDEP's farmer database; the conclusion that cows were producing on average 9.3 litres per day is reflected in the table for February 2018. Not all traditional breed cows we saw are yet in the best of condition, although MDEP is working hard on this.	We have no reason to dispute MDEP's comment that the achievement of 12 litres/cow/day is unlikely by February 2019. Of the cows we saw that have been bred from NZ semen, all were in good condition. However, they will not start producing milk until late 2018 at the earliest, so they are not yet contributing to milk production figures for MDEP. It is reasonable to suggest that further improvements can be expected by February 2019.
<b>3. National network of competent dairy advisers</b>	[1] Number of project-certified dairy advisers in LBVD.	18 (including 8 women) LBVD dairy advisers successfully completed advanced dairy management training, and demonstrated competencies in field. These are in addition to those trained as part of	From discussions we have had with MDEP and LBVD officers, this is a correct assessment of the number of dairy advisers trained and with competencies gained. From our observations, mentoring and	The stated target for this outcome of 15 advisers and 30% of them being women has been achieved. MDEP has exceeded both of these targets.

<sup>30</sup> Best practices include: ear tagging; record keeping; calf weight monitoring; heifer first mating weight achievement; calving interval; 24/7 water and feed available; mastitis monitoring; and Utilising AI

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

December 2017 design outcome	Indicator	Summary of project reporting February 2018	Evaluation comment	Likelihood of target achievement by February 2019
	[2] Number of project-certified dairy advisors in private sector.	<p>the MDEP office – a further 8 (4 women). Mentoring and coaching is ongoing.</p> <p>First private sector dairy advisor has successfully completed training. Another 7 have had partial training. No women as yet.</p>	<p>coaching is ongoing.</p> <p>We were unable to meet the first private sector dairy advisor. We accept MDEP's reporting, however.</p>	<p>The target of 10 private sector dairy advisors by February 2019 may not be fully achieved. The aim for 30% of them to be women is not likely to be achieved.</p>
<b>4. Good manufacturing processes adopted</b>	[1] Percentage of Nucleus farm processors complying with GMP.	<p>Training for processors provided and ongoing. Processing operations have been enhanced with new equipment, staff training, and adoption of GMP. Audit of compliance to be done in 2018.</p>	<p>We note from visits to processors that there has been and is being investment in new equipment; staff have been trained. To our knowledge 3 processors have so far received GMP certification from retailer Citi Mart. However, as reported, project supported audit of companies has yet to occur.</p>	<p>The current version of the MDEP farmer database includes reference to 21 processors, (although reports indicate this is 40). The 60% compliance therefor implies that 12 to 13 of them will be successfully audited. We cannot comment definitively on this further as the audit has yet to take place. But target likely to be met.</p>
	[2] Percentage of GMP nucleus processors with in-house laboratories.	<p>Strong processor interest in this development. 7 of the 7 nucleus processors currently investing in laboratory equipment, with advice and support from MDEP. Other processors also investing in laboratories. Ongoing.</p>	<p>Processors we met or visited are certainly very serious about milk quality and are taking MDEP advice on laboratory equipment. It is understood that 3 major operators currently have functioning in-house labs – we have seen 2 of these (Double Cow and Walco). This is a success area for MDEP.</p>	<p>The target of 60% of processors are likely to have in-house laboratories by February 2019.</p>
<b>5. High quality raw milk accepted for processing</b>	Percentage of milk delivered to collection centres from project supplier farms meeting approved milk quality standards.	<p>Farmer interest is strong and supported by processors, as shown through increased test samples submitted and improved milk quality. On SPC test 58% raw milk submitted for testing meets standard, and on E. Coli test 54% meet standard. Proportion of total</p>	<p>It is correct to say that larger farmer interest in meeting milk standards and to submit samples for testing to the LBVD laboratory is strong. We understand the test results quoted to be for larger farmers, who are submitting samples. Small farmers are becoming more aware of the</p>	<p>The target of 50% of all fresh milk delivered to collection centres meeting approved milk quality standards is unrealistic if the project is not able to estimate the proportion of total milk meeting standards. Note that the standard referred to is the Thai standard, as</p>

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

December 2017 design outcome	Indicator	Summary of project reporting February 2018	Evaluation comment	Likelihood of target achievement by February 2019
		milk submitted that meets standards is not known.	issue as well, although if they sell to self-employed collectors, they have no control over quality eventually passed to the consumer. Broadly we understand milk quality to be improving (although see note to right)	Myanmar does not yet have a national milk standard.

## Annex 5: MDEP Exit Strategy

This exit strategy was provided in the ADD for MDEP Phase 2.

The exit strategy is based on achieving the following:

1. A core of competent dairy extension advisors in government and the private sector. These people will be capable of advising farmers on how to improve all aspects of their dairy farming operations. In LBVD this group should be 10 to 12 people. In the private sector this group will be 10 people. Both government and private sector advisors will have been trained on the validated farming systems that have been developed. The LBVD officers will be capable of training new private sector extension staff, and new LBVD recruits.

**Evaluation comment:** MDEP has trained 22 extension advisors in the farming systems it has promoted, but only retains 3 full-time people. The full-time LBVD officers are capable of training further extension officers.

2. The extension advisors and LBVD will have training material and educational support resources to facilitate training. There will be two target audiences for these resources – other advisors; and dairy farmers. The LBVD Training Section will be competent at updating the training material and developing new material.

**Evaluation comment:** To our knowledge the LBVD training section has not updated training material or developed new material.

3. SOPs will be in place on all MDEP farms, in regard to milk quality. The extension officers will be capable of taking these practices to other farmers and advisors.

**Evaluation comment:** Milk quality SOPs are being displayed in farms. Full-time extension officers are conversant with the messages and capable of extending these to other farmers.

4. All processing staff will have completed a formal training programme and been assessed and certificated as competent. The certification of nucleus processors will be through the NZ project. A certifying agency will be found and supported during this next three years to take over this role.

**Evaluation comment:** Processor staff have been trained. During the remainder of 2018 audit of processors will occur (which equates to certification). Certification remains with the NZ project.

5. All processing operations involved in the project will have adopted GMP and been assessed as being compliant. An agency and staff will have been identified which can take over the training, advising, and assessment roles.

**Evaluation comment:** Citi Mart has established a good management practices based approved supplier scheme, with which MDEP processors selling to Citi Mart are now complying. Citi Mart, as a private sector company has taken on the assessment role but has yet to take on training and advisory roles. FDA has is now also receiving requests for accreditation against GMP, but this is this is voluntary at present (except for export purposes) and successful operations receive certificates based on WHO standards.

6. SOPs will be in place in retail businesses. A staff training programme will have been developed and in-house trainers trained to continue with new staff.

**Evaluation comment:** SOPs are in place in Citi Mart. Staff have been trained. In house trainers have not yet been trained. This could happen before end-February 2019.

7. The NDDB Secretariat will be capable of overseeing the implementation of the National Dairy Development Plan, and capable of ensuring that it is updated as required.

**Evaluation comment:** This has not been and will not be achieved.

## Annex 6: Stakeholder groups consulted

Stakeholder group	Location
<b>Government of New Zealand</b>	
MFAT	Wellington and Post
<b>Government of Myanmar</b>	
LBVD headquarters	Nay Pyi Taw
LBVD Veterinary Diagnosis Laboratory	Sintgaing, near Mandalay
LBVD Regional Office	Mandalay
LBVD Township Office	Aug Ban
Food and Drug Administration	Nay Pyi Taw
Yezin University	Near Nay Pyi Taw
<b>The Agribusiness Group</b>	
MDEP Project Team	Mandalay
<b>Farms and Processor Operations</b>	
CP Company Farm	Near Nay Pyi Taw
Aung Chan Thar Farm	Near Nay Pyi Taw
Unison Farm	Near Nay Pyi Taw
Fun Hwa Farm	Near Nay Pyi Taw
LBVD Farm	Nay Pyi Taw
Ko An We Milk Collection Centre	Sintgaing, near Mandalay
Double Cow Collection Centre	Sintgaing, near Mandalay
Tapel Milk Collection Centre	Tapel, near Mandalay
Schwe Oo Farm	Near Mandalay
December Farm	Pyin Oo Lwin
Daily Bread Farm	Pyin Oo Lwin
U Aung Myint Farm	Pyin Oo Lwin
Green Land Farm	Pyin Oo Lwin
Kaung Htet San Farm	Meikthila
U Khin Maung Soe Farm	Aung Ban
Walco Farm and Collection Centre	Yangon
<b>Discussion Groups at Farms</b>	
Myae Ngu Village Women's Discussion Group	Tapel, near Mandalay
Pan Taw Sat Women's Discussion Group	Meikthila
Nyaung Pin Thar Village Discussion Group	Aung Ban
<b>Retailer</b>	
Citi Mart	Yangon
<b>Other stakeholders</b>	
OIE Project	Mandalay
MITA Project	Mandalay
Greenovator	Yangon

## Annex 7: Documents used in this evaluation

Document	Source	Date
<b>Joint Commitment</b>		
Myanmar – New Zealand Joint Commitment for Development Cooperation 2017 - 2021	Both Governments	2017
<b>MFAT Documents</b>		
Evaluation Terms of Reference	MFAT	March 2018
Evaluation Policy for the New Zealand Aid Programme	MFAT	June 2014
New Zealand Aid Programme Strategic Plan 2015 - 2019	MFAT	2015
New Zealand Aid Programme Investment Priorities 2015 - 2019	MFAT	2015
Strategic Results Framework	MFAT	2018
Value for Money Guideline	MFAT	July 2011
<b>Government of Myanmar Documents</b>		
Myanmar Sustainable Development Plan (2018 – 2030)	GoMy	2018
Economic Policy of the Union of Myanmar	GoMy	2016
Myanmar Agriculture Development Strategy and Investment Plan (2018/19 to 2022/23)	GoMy - MoALI	2018
Myanmar Living Conditions Survey	Myanmar Central Statistics Organization, UNDP, World Bank	2018
<b>Project Cycle Documents</b>		
Activity Design Document (ADD) Myanmar: New Zealand Dairy Activity	MFAT	2013
independent Budget Assessment Myanmar Dairy Excellence Project Phase One	MFAT	January 2014
Activity Design Document (ADD) Myanmar: New Zealand Dairy Activity Phase 2	MFAT	January 2016
Appraisal of Activity Design for Myanmar New Zealand Dairy Excellence Project - Phase 2	MFAT	November 2015
Activity Completion Report: Myanmar Dairy Excellence Project – Phase 1	MFAT	April 2016
Activity Monitoring Assessment for MMR -Dairy Excellence Project	MFAT	July 2017
MDEP Results Framework December 2017	MFAT	December 2017
<b>MDEP Reports and Other Documents</b>		
Myanmar Dairy Excellence Project Review of Phase 1	MDEP	April 2017
MDEP Annual Report 2016 - 2017	MDEP	May 2017
MDEP Six-monthly Report March 2017 – August 2017	MDEP	October 2017
MDEP Annual Report 2017 – 2018	MDEP	April 2018
Tapel Village Milk Collection Centre Proposal	MDEP	June 2017
Briefing Paper – Dairy Farming Training for Village Women	MDEP	January 2016
Testing Methods IDEA Milk Quality Assessment Scheme	MDEP	September 2016
Myanmar Dairy Development Update	Fonterra	August 2017
Laboratory Expert Visit Report to Myanmar FDA	MDEP	March 2018

MFAT Myanmar Dairy Excellence Programme (MDEP) Evaluation, 2018

<b>Document</b>	<b>Source</b>	<b>Date</b>
Chemistry Laboratory		
MDEP Farm Datasheets	MDEP	Ongoing
MDEP Facility Fund Disbursement Datasheets	MDEP	Ongoing
<b>Other Projects</b>		
Columbia Dairy Value Chain Project Evaluation Report	MFAT	May 2017
Philippines – New Zealand Dairy Project Mid-Term Review Report	MFAT	October 2015
Myanmar Industry Training Activity Overview	MITA	2018
<b>Other Relevant Documents</b>		
Dairy Value Chain Assessment for Yangon and Mandalay region, Myanmar	FAO	2014
The Development of Dairy Farming in Thailand	S. Pichet	Undated
Milk Standard, Thai Agricultural Standard, TAS-6003-2010	MDEP from Thai sources	2010
The Myanmar Dairy Sector: Status & Business Opportunities	Wageningen University	2014
Selection of suitable varieties of grasses for Myanmar	Yezin University	Undated