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22 March 2013

Ms Joanna Spratt
314 Rolleston Street
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Dear Joanna

Official Information Act Request

Thank you for your email of 15 February 2013, addressed to Amanda Ellis, requesting under the Official Information Act a copy of the *Agricultural Diplomacy Opportunities in Myanmar: Scoping Mission, Final Report* (July 2012), and a note summarising the qualifications and experience of the person employed to undertake the scoping mission.

Enclosed is a copy of the final report on the scoping mission (which was carried out in Myanmar between 29 May and 11 June 2012). A few portions of this document have been withheld, with the relevant sections of the Official Information Act noted in the margins. The relevant grounds for withholding the information are section 6(a), to avoid prejudicing the international relations of the Government of New Zealand; section 9(2)(a), to protect the privacy of natural persons; and section 9(2)(g)(i), to protect free and frank expressions of opinions.

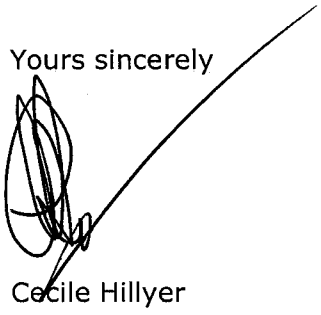
Also attached is a short note summarising the qualifications and relevant experience of the consultant who undertook the scoping mission.

You should be aware that the report was authored by the consultant and the views expressed are not necessarily those of the Ministry of Foreign Affairs and Trade.

MFAT is proceeding to follow through with the report's main recommendation; namely, to provide assistance to Myanmar in the area of small-scale semi-commercial dairy production and processing.

Under section 28(3) of the Act you have the right to request the Ombudsman to investigate and review the decisions to withhold information.

Yours sincerely



Cecile Hillyer
for Secretary of Foreign Affairs and Trade

Short summary of qualifications and experience for the scoping study

- Extensive experience in agriculture both in New Zealand and internationally;
- Extensive work history in South-East Asia;
- Wide-ranging work in both the public and private sectors - e.g. on farms, and as an international consultant;
- Skills include, but not limited to: research, extension systems, value chain analysis, subsistence and commercial farming, needs assessment, project identification, design, implementation and evaluation, institutional strengthening and relationship management;
- Educational qualifications include agricultural science qualifications at the postgraduate level.

Agriculture Diplomacy Opportunities in Myanmar:

Scoping Mission

Final Report

July 2012

Contents

Acronyms

ADB	Asian Development Bank
CBO	Community Based Organisation
FAO	Food & Agriculture Organisation
FSWG	Food Security Working Group
GoM	Government of Myanmar
INGO	International Non-Government Organisation
MFAT	Ministry of Foreign Affairs & Trade (NZ)
MK	Myanmar Kyat
NGO	Non-Government Organisation (National)
NZAID	New Zealand Aid Program
ODA	Official Development Assistance
SPS	Sanitary & Phytosanitary

Currency: NZ$1 = 660 MK

Executive Summary

This draft paper reports on the results of an eighteen day scoping mission to identify potential areas where the New Zealand Aid Program (NZAID) support may provide substantial benefits initially to Myanmar but in the longer term to both countries. It describes the operational environment, current Official Development Assistance (ODA) support a brief analysis of relevant agriculture sectors and from that suggests a number of options for NZ government support.

The environment for ODA support to agriculture and rural development in Myanmar is challenging. Major policy issues such as medium-long term land use rights along with high rural poverty restrict the ability and willingness of farmers to invest in improvements in agricultural productivity. Poor infrastructure in rural areas, including poor and in some cases no roads, a very low level of electricity connectivity and poor access to markets, exacerbates the difficulties of the policy environment. The highly bureaucratic and top-down approach currently practiced by relevant government ministries does not encourage farmer decision making and apart from an ageing upper management group the technical and technology transfer capacity of government staff at all levels is low.

The risks of implementing a large scale ODA program are high, but in spite of these risks it is important that countries like New Zealand engage now. Such engagement has the potential to significantly improve the operational environment and along with that improve agriculture productivity, decrease poverty and improve both food security and nutritional quality of the diet. The scoping mission identified seven project areas but only three are considered high priority. Each of these are in areas where (i) New Zealand has a competitive advantage; (ii) there is little other ODA support; (iii) the long term impact is likely to be high in terms of poverty, food security, food quality and safety, integrated value chains and import substitution; (iv) NZ support could be used to gain a well-recognised position as a key donor and in the longer term use this recognition to develop on-going partnerships. From a relevance perspective the three high priority opportunities are ranked in the following:

1) ***Small Scale Semi-Commercial Dairy Production and Processing*** is a very high priority for the Government of Myanmar (GoM). It is also an area where NZ has considerable technical expertise, although because of scale, the commercial opportunities for NZ infrastructure and input suppliers are relatively small. Development outcomes and impacts will be limited to a relatively small number of relatively well-off direct beneficiaries in the short-term, until scaling up occurs but the potential for employment along the value chain, although initially low could be significant in the longer term. The potential target areas would be the Mandalay Region and close to Yangon. The project would demonstrate a number of relatively small dairy farmer owned and managed dairy industry cooperatives. In the short - medium term each cooperative would consist of 20-25 farmers each with 8-10 milking cows producing 10-12 litres of milk per day (1600 – 3000 litres/day). The cooperative would own and manage simple post-harvest processing facilities (batch pasteurisers, generators, cool chain etc.) and undertake value adding to produce products such as yoghurt, milk-based deserts, unsweetened and sweetened condensed milk etc. The regulatory and compliance required for milk quality assurance and for food safety of processed milk products would become operational through advice to GoM on food safety. It is expected that some capacity development for government analytical laboratories and regulatory authorities would be required to improve compliance to milk quality standards. Relevant technologies include introduction of improved breeds, improved forages and forage conservation techniques, use of low cost irrigation, small scale processing and value adding equipment and practices. Benefits are likely to start flowing in year 1 as feed intakes are increased and the introduction of improved breeds will increase milk yields after about 4 years as long as adequate high quality feed is available. Training in animal husbandry and animal health for farmers and service providers will be essential and as markets for fresh milk and high quality

processed milk products increase, new farmers would be encouraged to join the cooperative through some form of equity/project benefit sharing and an ownership stake. This project would require a commitment for at least 10 years before it could demonstrate a significant and sustainable impact. For the first five years it is expected that the NZ investment would need to be around NZ$5-6m, and inputs required would include infrastructure and equipment, technical inputs and capacity development.

2) ***Fruit and Vegetable Value Chains*** have the potential for greater development outcomes than for the dairy project; at least in the short- to medium- term as if it is successful it will impact on a large number of relatively poor beneficiaries. However this is seen as a lower priority for GoM and although technical expertise is required and is available from NZ it is not an area where NZ has a large competitive advantage. The technology is not complicated and the major inputs would revolve around facilitation of very small scale farmer interest groups and application of good agriculture practice principles. The degree of difficulty is high due to the dynamics of group cohesion, and although producers will see improved incomes, it will take considerable time before benefits are measurable along all points in the value chain. The initial focus on fruit is based on production and marketing of quality fruit/vegetables for import substitution as a very high proportion of fruit at the higher end markets is imported (mainly from China). The project would be located in the central dry zone and could involve development of a strong value chain focusing on high quality and safe product for niche markets. The value chain structure will be built on a relatively large number of producers (3-5000), working in groups (modern cooperatives) under contract production systems that deliver market requirements in terms of volumes, variety, quality and continuity of supply. Development of intensive covered production systems and use of micro-irrigation are interventions that are likely to assist in achievement of the vision. Relevant technology includes introduction of new market demanded varieties, improvement of agronomic techniques, better use of inputs including micro-irrigation and improved harvest and post-harvest handling. The benefits are likely to start flowing in year 3 but will be relatively small until fruit trees reach maturity. This project would require a commitment for at least 10 years to be able to quantify impacts and ensure sustainability. Initial inputs would include introduction of new varieties, agronomic skills development, market facilitation and development of small scale infrastructure such as packhouses. It is estimated that in the initial stages (5 years) the project cost may be around $3-4m. Disbursement and change will be slow initially but will speed up towards the end of the first five years.

3) ***Small Ruminants*** would focus on sheep production in the Central Dry Zone. Traditionally sheep and goats are farmed together often by landless farmers. GoM sees goats as the main small ruminant priority with a focus on exports, but the Livestock Federation sees equal potential for sheep. NA has appropriate expertise, most of which is not complicated and involves adapting NZ experience in animal husbandry and disease management to a small, but extensive farming system. This project would target farmers who have limited access to land and through that are capable of implementing technologies that will improve productivity and profitability. The project would demonstrate the development of a value chain targeting the higher end market in major cities through improved production of introduced sheep meat breeds, simple but effective technologies such as quality forage production using small scale irrigation, supplementary feeding of by-products of the beans and pulses industry, introduction of improved animal health care, development of lead farmers and farmer to farmer extension and potentially much improved and hygienic slaughter facilities linked to niche markets. It is expected that due to the nature of the land availability (small areas, insecure tenure) some form of cooperative would be required for both slaughter and marketing. Direct contracts with supermarkets or specialised butcheries are likely to be the most effective market route. The number of beneficiaries is likely to be

high and benefits will start to flow around year 3 and increase significantly from year 5. This project may not need a 10-year commitment but it will be difficult to quantify the range and size of benefits before year 6. It is expected that the project value would be around $3-4m over a 5 year timeframe. It will be much larger if sheep imports are included but this is not recommended.

Three of the other potential projects (i) Apiculture; (ii) Beans & Pulses; and, (iii) agriculture education and training were considered lower priorities. The apiculture project is small in terms of total investment required, but it could be a useful entry point for NZ to gain experience and develop collaborative partnerships with government agencies. The beans and pulses project would be built on good practical experience and a relatively large total production and export, but where significant improvements in yield and quality could be achieved. It is an area where many other bilateral agencies are likely to also be interested and where NZ is not as competitive as other countries. The Agriculture Education project is likely to have the most significant long-term impacts on poverty and food security (even considering the high priority projects). It is an area where NZ has well recognised and world leading expertise. However impacts from this project will take many years (10-15) before they are evident and measurement or attribution of improved farm management and agri-business skills to overall improvement in the agriculture sector will be very difficult. If NZ is committed to a very long term project this would be well worth considering.

Governance and Management of ODA support will need careful consideration. The capacity and flexibility in operational policy and procedures within government departments is relatively weak. As NZ has no permanent presence in Myanmar (and is unlikely to do so in the foreseeable future) it is suggested that aid delivery will be more successful if two types of partnerships are considered: (i) implementing partners; and, (ii) supervising partners.

Potential implementing partners, both in NZ and Myanmar have also been identified. From the NZ side it is important to note that suggested technology is not complicated and apart from some basic applied research in the form of demonstration trials the opportunity for research will be very limited. Because of this the appeal to the Crown Research Institutes as service providers may be very limited. NZ service providers with a strong agriculture extension track record may provide the best option, but the international experience of these is limited.

From the Myanmar side there are many International and National Non-Government Organisations (INGO & NGO) with implementation experience. At this stage the flexibility required to implement ODA through government ministries is unclear and this is likely to constrain the potential for success. Some INGOs and NGOs have focused in the three priority areas identified and these are suggested as the best option for implementation. It will be important to ensure that whoever becomes the implementing organisation/agency is fully accredited by GoM and has strong networks into and beyond government at the national, district and even township levels.

The presence in Myanmar of potential partners for the supervising role is pretty much limited to INGOs.

1. Approach and Methodology

While the finer detail of the nature and scope of the Agriculture Diplomacy initiatives is evolving, there are nevertheless some broad directions and comparative advantages in agriculture and horticulture, in particular fruit and the pastoral sectors of sheep, beef and dairy. In particular New Zealand sees its strengths in:

1) A market lead approach based on successful development of integrated value chains;
2) A strong agriculture research system and practical agriculture technologies;
3) An excellent bio-security system and first class sanitary, phytosanitory and food safety systems; and,
4) High quality agriculture education and training.
5) A practical approach to farming systems and farmer skills development.

The scoping mission further interpreted that New Zealand wished to build on its agro-industry and agriculture organisation/agency strengths, including research, education and agriculture vocational training. With this in mind the consultant considers that within the constraints to development of Myanmar agriculture the agriculture diplomacy priorities should include:

1) A more business-like approach that clearly identified opportunities for NZ businesses/ organisations and linked both soft and hard interventions;
2) A focus on NZ investment in areas where NZ strengths and interventions will be clearly recognised rather than consultancy per se as a delivery modality;
3) Opportunities for an NZ Inc. approach that might lead to broad based agro-industry development and capacity development at government, industry and farmer levels;
4) Potential to link one or more of the NZAID flagships (e.g. scholarship program and/or young business leadership development) with agriculture diplomacy;
5) Larger rather than smaller projects with measurable results;
6) Use of ODA funding as a "pump primer" for on-going business activity, rather than the longer term "aid dependency".
7) A focus on interventions where NZ has a niche advantage and where NZ knowledge and skills have the potential to deliver significant impact; and,
8) Outputs and outcomes that are achievable.

The methodology included:

1) Ministry of Foreign Affairs & Trade (MFAT - NZ Aid Program) briefing in Wellington and discussion on Terms of Reference, previous NZ Aid support, background and approach to be taken for the scoping mission;
2) A desk study, through the internet to provide background on Myanmar agriculture, the nature and scope of ODA interventions, identify key contacts and make initial appointments;
3) In-Country briefing with First Secretary Development Bangkok;
4) A two week site visit to Myanmar;
5) Debriefing MFAT in Bangkok & Wellington;
6) Preparation of Draft and Final Reports.

This report follows field work undertaken in Myanmar from May 29th – 11th June 2012 and a debriefing teleconference with First Secretary, Development and the Senior Development Programme Coordinator, Bangkok and a meeting with NZ AID Program staff on 10 August 2012. Annex 1 provides details on the field visit meeting schedule and also lists Persons Met.

At this stage no consultation with potential NZ partners has taken place.

2. Agriculture & Rural Development Context

Overview

Availability of good statistical information and an overview of Myanmar agriculture is problematic. Depending on who is asked the population is around 60[1] million. Approximately 65% of the population resides in rural areas. Poverty is a major issue with nearly 30% of the population below the poverty line. Other statistical sources[2] suggest that 16% of the population is below the minimum level of dietary intake and estimates of child stunting range from 30-40% of all children.

Agriculture production is predominantly subsistence. The State owns all land and almost all farmers have small land areas under insecure usufruct rights (<5ha). International non-government organisations (INGOs) express concern that displacement of land users has enabled collection of larger land holdings (mainly in rice producing areas). Large scale deforestation has occurred, which has increased the risks of erosion and recently large scale re-forestation, mainly by the state but also through community participation in some cases has resulted in relative large plantation areas of teak and rubber.

The agriculture sector occupies 35 - 40% of the total GDP[3]. Myanmar priority for agriculture is focused on production for export, with significant exports from, rice, beans and pulses, maize, sesame, sugarcane, fish (capture and aquaculture) and timber. The total value of agriculture exports is around $1.8billion (2010). Most exports are raw materials with little value adding. The value of food imports is in excess of double the value of agriculture exports.

Export markets for agriculture (and other products) have significantly weakened. For rice, beans and pulses the export markets have essentially collapsed because of a highly overvalued currency. The Myanmar Kyat (MK) is estimated to be over-valued by about 40%[4] and most agriculture products suffer from a lack of competitiveness in terms of price, quality and food safety. While government recognises the need for change, the policy and regulatory framework for agriculture is currently undeveloped and will require significant improvement before resource poor and risk adverse farmers will feel confident to invest in improved agricultural productivity quality and food safety. Agricultural land is owned by the state and security of land use is not always certain.

6(a)

almost all agricultural production is exported as raw material.

The current operational environment for agriculture is likely to significantly constrain the potential for success of any donor support. Until recently an embargo on working with government agencies has been enforced and bilateral donors have channelled money through a bilateral trust fund: Livelihoods and Food Security Trust (LIFT) Fund. The capacity and experience of government departments to work in donor supported projects is relatively low, particularly at the national level. Engagement with government ministries is challenging (especially for the Ministry of Agriculture and Irrigation) with a process of Ministerial approvals requiring significant delays. Government Ministries seem reluctant to work with INGOs and local Non-Government Organisations (NGOs) and there is a time consuming process involved for registration of international and national NGOs. Nevertheless NGOs are active and receive good interest/commitment from local government extension workers at the township level. Capacity of government agriculture research and extension workers and availability of local government budget is not high.

The Ministry of Agriculture and Irrigation priorities revolve around increased rice production through introduction of hybrid rice and improved agronomic practices, rehabilitation and development of

[1] ADB Fact Sheets
[2] WHO Statistics
[3] World Bank Indicators
[4] Personal Communication Harvard University/Proximity Designs

large-scale irrigation systems, and mechanisation. While there is interest in other areas of production such as fruit and vegetables the availability of resources within the Ministry are low and most of the interventions in these products are the result of the activities of international and national NGOs. However at this time apart from one or two market related activities by NGOs, there is little activity in areas of food quality and safety for fruit and vegetables.

Within the Ministry of Livestock and Fisheries the main livestock priority is improved medium and large-scale commercial pig production. The private sector is active and a leader in poultry production and to a lesser extent pig production. Large scale feed mills (e.g. CP Group) are active in Myanmar both in feed concentrate production and large scale commercial pig production. There are also a number of locally owner concentrate feed Small & Medium Sized Enterprises – usually specialising in niche markets for specialist feeds. There is strong interest in small ruminants (goats and sheep) and a strong desire to greatly increase the contribution from improvements in dairy production, milk quality and food safety. Apiculture is also seen as a priority with potential as a mechanism for reducing poverty levels, especially for landless farmers. Aquaculture is considered (like most other SE Asian countries) as a very suitable option for improving livelihoods. Most of the aquaculture production systems revolve around a capture/hold/harvest system. The ability to create an impact in this industry is severely limited by a highly controlled concession licencing system and an inability of ordinary farmers to access water resources. There are few (if any) aquaculture hatcheries or nurseries and the wild capture of species has severely depleted the natural resources.

In relation to New Zealand's strengths the following is noted:

a. New Zealand has little competitive advantage in rice production, processing and value adding. Similarly we do not produce machinery suitable for small scale cultivation, harvesting and processing. Other Asian nations, notably China and Thailand are the leaders in this field.
b. Irrigation rehabilitation is extremely costly and rehabilitation will be undertaken but probably through concessional loan from World Bank or Asian Development Bank.
c. The performance of pumped irrigation schemes so far is a major problem in Myanmar. The Government of Myanmar does not provide any operating capital for pumped irrigation schemes and a potential solution involving the development of Water User Groups is an option. Again other countries and other agencies have much better experience than NZ.
d. Because of this it does not make sense for NZ to involve itself in the arable sector apart perhaps from improvement in beans and pulses in the Dry Zone.
e. NZ strengths in fruit and vegetable production, quality, food safety and the value chain approach to market development is at the leading edge. Fruit and vegetable quality in Myanmar markets is generally poor, with higher quality and a wider range of fruit being imported from China.

6(a)

f. The New Zealand farming systems are not particularly appropriate to other farming systems around the world, notably Asia. There are 72 farming systems in the world. These can be classified into 8 broad categories. The category common to New Zealand is classified as Dualistic (a mix of large and smaller scale commercial farms with diverse production patterns). It is characterised by an intensive specialist production systems with a high level of capital investment on-farm and in off-farm infrastructure, notably value adding. It is the only farming system that is not dominated by smallholders and a major element of poverty. In Myanmar rice production is a monoculture with (as yet) little diversification even in the dry season), and all farming systems involving livestock are mixed.
g. Livestock production on the other hand is increasing seen as a way out of poverty but the livestock farming systems in Myanmar are low input, low output systems and for households provide little income. As in much of developing Asia, ownership of livestock is

seen as the equivalent to a bank account, with liquidity often driven by family needs (e.g. education and health fees) catastrophic events (natural disasters and death).

h. Pig and chicken production in NZ is driven by the private sector. In Myanmar this is also true – with large companies such as CP (Thailand) basically controlling production through their livestock feed mills and large commercial pig production operations. NZ therefore has no competitive advantage.

i. NZ does have very competitive strengths in livestock, particularly dairy and small ruminants (sheep).

j. The ability to move towards larger holdings is limited due to issues relating to land ownership/usufruct rights, but nevertheless the size of holdings is increasing. Displaced farming households are an issue (especially with ethnic minorities) although dissent seems muted because of the political environment. In many parts of Myanmar, farmers from minority groups (e.g. Rahkine) are essentially "landless farmers".

k. Improved dairy production is a high priority for Myanmar although because of the cost of imported feed dairy industry development is likely to be highly uncompetitive. There are opportunities for local feed sources, especially using by-products of rice, beans and pulses, but also through the introduction of high quality forages. Consumption of dairy products is very low[5]. Design and implementation of a project to improve sustainability of dairy farming in Myanmar is not straightforward. It is not possible to superimpose New Zealand farming systems (from either an agronomic or investment perspective). However there are opportunities to assist in the development of small-scale semi-commercial dairy farms – where dairy production forms the major income source.

l. The agriculture policy and regulatory environment is characterised by an almost complete lack of policy & regulations. As in other developing countries agriculture development does not happen unless an enabling policy and regulatory is developed. The scope for change is enormous and the challenge daunting. This is one area where NZ does have good skills, but implementation will require a much higher budget that available to the NZ Aid Program.

In summary opportunities for support to the agriculture sector are few and include.

1) Fruit and vegetable Value chain
2) Semi-commercial dairy production
3) Small ruminants especially sheep but including goats
4) Apiculture
5) Beans and Pulses
6) Agriculture policy and regulation development
7) Agriculture education and training

An analysis of the strengths, weaknesses, issues and fit of each of these opportunities is summarised in Annex 2.

Further investment in LIFT is discounted as LIFT appears to be developing its own agenda, particularly in the community based social consensus and strengthening of community-based organisations, human rights and rural development policies, with lower emphasis on enhancing income generation.

Investments in aquaculture were also discounted as the aquaculture industry is based on a capture and grow-out model, which is under threat due to exploitation of the natural resource. While NZ does have significant expertise in aquaculture and is a world leader in molluscs other countries have much more experience in the species that are priority in Myanmar (shrimps/prawns, marine and freshwater finfish).

[5] Approximately 2.5 litres/day compared with Indonesia > 11 litres, Vietnam >13 litres, Thailand >30 litres and India >70 litres/day

ODA Support

Embargoes on aid development support mean that donor and lending agency support for the agriculture sector (apart from LIFT) has been absent for many decades. Within the relevant opportunities outlined above the major interventions of interest include:

Livelihoods & Food Security Trust Fund (LIFT)

LIFT is managed on behalf of many donors, by UNDP. Most of the on-going interventions revolve around the establishment of Collective Groups (CG) and the provision of inputs, often under a cash-for-work type program, establishment of revolving micro-credit, strengthening of community-based organisations, establishment of township based nurseries, and establishment of demonstration plots with farmer training in a range of activities. A significant number of the interventions are based on improving rice farming systems.

In the Dry Zone area project of interest focus on small scale and small animal livestock (pigs & poultry) projects, establishment of livestock banks and a small project on value chains of vegetables. A component of one project supports improved seed quality and productivity of pulses.

A project concept for a pipeline project promoting larger scale goat production, mainly for live animal export to Bangladesh and Malaysia has been submitted. Government approvals for expansion of quarantine facilities for live animal export have already been gazetted. Decisions on project funding will be made at the end of June 2012.

An FAO TCP is assisting LIFT to prepare a US$20 million livelihoods project in Rakhine State. This proposal is not yet complete and will need to be appraised and approved by the LIFT management & Board.

AusAID

A contract between AusAID and the Australian Centre for International Agriculture Research (ACIAR) has been signed. This is an AUD$12m project over 4 years. A concept note has been developed and this program is scheduled to commence implementation in July 2012. The concept note describes 5 components (i) Productivity in grain legumes (Central Dry Zone); (ii) Diversification and intensification of rice production systems (Central Dry Zone and Ayeyarwady Delta); (iii) Smallholder aquaculture development following rehabilitation after cyclone Nargis (Central Dry Zone, Ayeyarwady Delta); (iv) Support for smallholder livestock-based cattle enterprises (Central Dry Zone); and (v) Socio-economic affecting the acceptability and adoption of promising technology. The Concept Note lacks detail on what outputs or outcomes will be achieved and much of the information provided indicates that many of the interventions will take the form of information gathering rather than adaptation and adoption of improved agriculture technology.

AusAID supported a project aimed at development of the Dairy Industry in the late 1980s early 1990s. This followed importation of Friesian cows under a World Bank Loan in 1978.

6(a), 9(2)(g)(i)

The predominately Friesian cross cows now existing in larger scale dairy herds close to Yangon have arisen from crossbreeding local cows with imported frozen Friesian semen.

Asian Development Bank

A project scoping mission has been completed by ADB. The focus of this proposed project is agriculture policy and regulations. As in other countries improvement of agriculture productivity is underpinned by good agriculture policy. It is as yet unclear exactly what this proposed project will focus on, but the potential scope is daunting.

FAO

The FAO Technical Cooperation Programme (TCP) lists 10 current interventions. In 2004 FAO provided training to small scale dairy producers and processors. Some of the on-going interventions are related to development of procedures to conduct a census of agriculture and many of the others are regional programs: -animal health and pesticide harmonisation, sanitary & phyto-sanitary regulatory frameworks, specific animal disease management (e.g. Blue Ear) and analysis of post harvest value chains to reduce losses. Of interest is a regional programme to encourage school milk programs and a two year pilot project providing 200ml milk per day to 2000 school children in Myanmar is supported. FAO is also assisting The Ministry of Livestock & Fisheries Livestock Breeding and Veterinary Department (LBVD) develop livestock priorities and within that the role of FAO over the 2010-2015 period. It is currently preparing a livestock study outlining the structure of the livestock sector and some production statistics.

6(a), 9(2)(g)(i)

NZ Aid Program

Apart from limited support to LIFT, some small scale support was provided to Proximity Designs for start-up funding for the initial scaling up of treadle pumps for small scale irrigation systems. Apart from this there are no existing NZ/Myanmar partnerships upon which new interventions could leverage.

Non-Government Organisations

In the environment of donor embargoes, and in the context of disaster relief operations following Cyclone Nargus, a large number of international and national Non-Government Organisations (NGOs) are operational. The activities of the NGOs and Community Based Organisation (CBOs) are coordinated by the Food Security Working Group (FSWG). FSWG members include 27 International NGOs, 14 Local NGOs and 23 CBOs. Most of the funding for these groups initially came from disaster relief sources and then recovery sources. Over time the funding for relief and recovery has significantly declined and many of the NGOs have refocused operations into rural development. A significant proportion of the NGO activity still focuses on rural community organisation, the fight for human rights, and resource use (land etc.) rights and the development of civil societies. Only a few NGOs have experience in the adaptation and introduction of technologies for improved agriculture production and even fewer have experience in value chains of any agriculture product. However they all have good networks particularly at the township level and in terms of project implementation some NGOs could be very useful partners.

3. Aid Delivery Modality

Currently New Zealand has no presence in Myanmar – either diplomatically or from an aid delivery perspective. Delivery of any support as a consequence of this scoping study will have to rely on the development of sound partnership arrangements. This could be with other donors, but may be better with existing INGOs and NGOs with a sound track record and established relationships with government agencies, notably the Ministry of Agriculture and Irrigation and the Ministry of Livestock and Fisheries.

It is suggested that two partnership relationships will be required at least in the short term.

1) Implementing partners, including INGOs, NGOs, government departments, CBOs and producer associations. One of these implementing partners should be responsible for project management (Lead Agency). For each of the priority interventions some suggestions are made regarding suitable partners, both from the Myanmar and NZ sides. There are difficulties in relation to the NZ partners. The relevant technology is relatively simple and research, if any, is adaptive. The Public sector reforms in Crown Research Institutes has resulted in most (the exception is Landcare) opting out of development unless it has a contribution to its core business (i.e. research). For this reason it is not expected that the

CRIs would be willing partners. Landcare is an exception, but the resources and skill required mean that almost all team members would have to be recruited from outside Landcare staff. The universities could be effective partners, especially if they strengthen their theoretical development studies with practical experience and use this to link to the NZ Scholarship program. However neither Massey nor Lincoln shows much enthusiasm about this prospect.

2) Supervision partner. This partner should be locally based and take responsibility for overall monitoring and supervision of project implementation. This partner should not be a member of the implementation team, but operate arms-length to ensure that project objectives, outputs and outcomes are on track to be delivered. These partners should also work with the implementing partners to assist in development of a monitoring and evaluation strategy, workplan and procedures for measuring impacts, both within and outside the farm gate. During the scoping mission only two potential supervising partners with the appropriate skills were identified: Proximity Designs (not the farm advisory services, but at a higher level); and Pyoe Pin Programme, attached to the British Council.

6(a), 9(2)(g)(i)

4. Potential Opportunities

Seven potential opportunities are identified in this scoping study. Annex 2 provides some basic detail and potential approaches for developing project concepts are outlined below.

Higher Priority

Small-Scale Semi-Commercial Dairy Production & Processing

Background and Rationale:

According to FAO data there are three dairy production systems.

1) ***Small scale native breed milk production***. This is a symbiotic system with very small income generation. There are approximately 12 million local cattle used primarily as draft cattle. They calve around 3 years of age and the calving interval is often in excess of 18 months. Approximately 30% of these are cows and around 400,000 of these cows are milked once a day. These cows are share-milked by calves up to weaning time (around 6 months of age). Daily milk harvest is low (1-2 litre per day), the milk is collected by traders and the small cash income (approximately MK900 per day) provides a net return per cow of around MK500 per day per cow. Much of the milk is processed into condensed milk.
2) ***Small scale cross-bred herds***. Herds of 2-3 milking cows. Cows are fed on grass cut and carried from roadsides and any available unoccupied land. Milk production is 4-5 litres/head per day. Farmer income is around MK1500 per cow per day and net returns, after feed and animal health costs of around MK800 per cow per day are deducted. Additional income comes from the sale of weaned calves at 6-8 months of age. The farming system is low input: low output and many of the farmers are classified as landless farmers, with cows tethered close to the house. Milk is collected by traders and most processed into condensed milk.
3) ***Intensive milk production herds.*** These are specialist milking herds, predominantly close to Yangon. There are 7 larger herds ranging from 150-400 cows, mostly Friesian or Friesian cross. These cows occupy about 20% of the total milking cow population, but produce about 50% of all milk produced in Myanmar. Cows are tethered in open-sided concrete floored sheds. Feed is all bought in with a mix of relatively low quality roadside grasses, cut, carried and sold by villagers and a high level of concentrate feed produced by a number of larger (e.g. CP) and smaller locally owned and operated feed mills. Fresh milk is sold, most of it in a

raw milk state but there is one small processing plant that pasteurises milk and produces yoghurt, milk based deserts and some cheese. This processor buys milk from other smaller producers and processes about 1500 litres per day. Products are sold locally and to supermarkets and the premium for higher quality processed milk is not large. The economics of this farming system is uncertain but the high prices for fresh milk probably make the systems profitable. The environmental risks associated with this farming system are high, animal health is marginal and waste management systems almost totally absent.

New Zealand could not be associated with small-scale native breed and dairy production as the milk produced under these systems is essentially a small cash generation by-product of animals used for draft purposes. New Zealand might also find it difficult to be associated with intensive milk production systems as now practised in Myanmar. Improving the current intensive milk producing systems would require significant infrastructure upgrading and a major change in the attitude and approach of existing dairy farmers. The concepts of milk production under hygienic and safe conditions are not practiced. Concepts such as waste management through biogas have been rejected by the owners and managers; there seems no desire to negate quite severe environmental impacts; the sanitary and product safety systems are rudimentary. Any reasonable regulatory framework for production and processing of milk would probably lead to a shutdown of these operations. From a development perspective support for upgrading the existing larger scale production systems, even if farmers/investors were supportive would have impacts on an unacceptably low number of direct beneficiaries. This would lead to a high level of aid capture by a few whose expectations of subsidised capital in the form of infrastructure and livestock are high.

Potential Opportunities

Initial observations suggest that if New Zealand was to invest in the dairy industry in Myanmar, the focus should be on small commercial milk producing farms, linked to available and perhaps expanded SMEs with registered and accredited processing systems. The farming systems suggested would consist of: (i) land area of a minimum of 1 ha preferably larger (5 ha); (ii) herd sizes of at least 8 - 10 milking cows; (iii) introduction of home-grown forage production systems and linking this with strategic irrigation building on the successful introduction of treadle pumps by *Proximity Design*; (iv) introduction of small cows moderate to high milk production (e.g. Jersey, Brown Swiss) rather than Friesian to significantly decrease feed costs and improve the overall efficiency of milk production; (v) use of balanced diets, including forage and by-products from agriculture production (e.g. rice straw, rice bran, processing of beans and pulses etc.); (vi) enterprise analysis skills to address key cost and income issues, and (vii) support to SMEs to improve profitability and operation of the value chain. Clusters of 20-30 small scale farmers could be developed as a model and replicated in a number of locations where conditions for dairying are more favourable and access to larger markets is easier. (Yangon, Nay Pyi Taw and Sagaing?)

Development of these dairy farming and processing systems would include pasteurisation and packaging for local fresh milk consumption (including school milk program), production of yoghurt, sweetened condensed milk and speciality products such as caramel Cream Brule and ice cream. Currently there is only one milk processing facility (WALCO) approved by the Myanmar Food and Drug Administration, although seven large milk production companies target the fresh milk markets in Yangon. Current throughput of the approved facility is around 1500 litres per day but extra batch pasteurisers are about to be installed which will increase the capacity to more than 2500 litres per day (250 cows @10 litres per day – a total dairy herd of 350 cows under reasonable management conditions).

Key component of this intervention should include awareness of the quality and safety of milk produced under good farm management practices and sanitary, certified processing systems. As consumption of milk in Myanmar is very low, awareness should also include the value of milk in the

diet particularly for children. The policy and regulatory environment for milk quality and safety should also be addressed, particularly support to assist in compliance.

The main markets for milk are likely to be close to Yangon. There is a livestock zone outside Yangon, and this may have some potential and there may well be opportunities to increase the number of livestock zones close to Yangon. Alternatively the location of a project of this nature could be in the Mandalay region as the largest processing facility (almost exclusively processing sweetened condensed milk) is located there. Processing facilities for fresh pasteurised milk would probably need to be established, but the scale of these operations especially in the short term is likely to be small.

Some consideration is required on the prospects for establishing a small producer owned processing facility (SME or small cooperative dairy company model) and strategies for expanding the direct and indirect beneficiaries through employment in value adding and longer term beneficiary obligations to recycle investments (cow banks, etc.).

There may be benefits for NZ. Initially supply of equipment may be an opportunity, but as most farmers do not have electricity, hand milking is likely to be practiced. Sexed semen and AI equipment from NZ would be appropriate but the volumes will be relatively small. Development of the cool chain may be a longer term opportunity and some NZ innovations for solar powered cooling chambers might be appropriate. Small scale processing (e.g. batch pasteurisers) could be sourced from NZ, but are probably cheaper elsewhere. There is little prospect of NZ dairy processing companies investing in Myanmar in the medium term. The market is relatively small (US$50m total).

The NZ example of farmer owned dairy cooperatives provides a good model, albeit the scale of operation in Myanmar is likely to be smaller and less sophisticated that that operating in NZ in the early 1950s!

6(a), 9(2)(g)(i)

Potential Partners in Myanmar include:

1) *Ministry of Livestock and Fisheries:* in particular the Livestock and Veterinary Breeding Department, and including veterinarians and paravets in townships and districts;
2) *Myanmar Livestock Federation;*
3) *Win Agro-Livestock Co., Ltd;*
4) *Proximity Designs:* Location of existing treadle pumps and use of Farm Advisory Service;
5) *Golden Plain Agribusiness consultants Group.*

Based on observations during the scoping mission the Golden Plain Agribusiness Consultants Group has the necessary skills to lead implementation. There would need to a partnership approach to implementation including the Dairy Farmers Association (under the Myanmar Livestock Federation) and the Ministry of Livestock and Fisheries for services involving technical, regulatory and integration of the project into the long-term dairy industry development strategy.

Potential Service Providers from New Zealand include:

- Agribusiness Group
- AgFirst
- Dairy Services Limited
- Massey University
- Lincoln University
- AgResearch

The technology that would be employed is widely known in NZ and apart from some adaptive research/technology demonstrations, has little research potential. As such it is unlikely that AgResearch would be interested in this type of work. Some of the consulting officers working with

various regional Dairy Services Limited agencies have good extension skills but little to no experience in the typical tropical dairy production systems (scale of farming and tropical forage management). Massey University, if interested, could be the lead agency as they have access to tropical dairy expertise, skills in small scale systems for milk processing and development of laboratory services for backstopping milk quality regulations. Again a partnership approach is desirable with one of the extension and agri-business service providers if some experience in tropical dairy production systems can be demonstrated.

Potential Impacts and Timing

The timeframe for a project of this nature is at least five years but preferably longer. Local crossbreed cows could be upgraded, and while these local cows could be milked it would be at best two years and possibly three years before milk production from improved cows would commence. The impact could be increased through using sexed semen, but the general experience in Asia is that sexed semen has a lower conception rate to first service than normal semen.

In the early years of implementation focus would be on development of facilities for housing cows, introduction and evaluation of improved forages, development of balanced diets and procedures for hygienic milking and milk transport systems. Depending on the scale of operations there may also be a need to introduce or scale up milk processing facilities, but access to, and reliability of electricity supply is an issue.

As with other potential options, small small-scale dairying would require the development of agribusiness and farm management skills and for milk production upgrading and provision of adequate animal health services.

It is highly likely that if this opportunity was taken up there would need to be a commitment of at least 10 years.

Investment

It is expected that over a 5 year timeframe an investment of $5-6m would be appropriate. Support would include infrastructure, other inputs such as semen (AI) and forage seeds, equipment such as forage choppers, silage bags, etc. and capacity development for farmers, public and private extension workers and those involved in analysis and regulatory functions and compliance to improve food safety.

Medium Term Vision

Development of a model to demonstrate a relatively small dairy farmer owned and managed dairy industry cooperative. In the medium term the cooperative would consist of 20-25 farmers each with 8-10 milking cows producing 10-12 litres of milk per day (1600 – 3000 litres/day). The cooperative would own and manage simple post-harvest processing facilities (batch pasteurisers, generators, cool chain etc.) and value adding to produce products such as yoghurt, milk-based desserts, unsweetened and sweetened condensed milk etc. The regulatory and compliance required for milk quality assurance and for food safety of processed milk products would be operational.

Farms would produce at least 70% of total feed requirements through introduction of improved forages and forage conservation techniques. As the model is proven and markets for fresh milk and high quality processed milk products increase, new farmers would be encouraged to join the cooperative through some form of equity/project benefit sharing and an ownership stake.

This model could in the longer term develop into a significant farmer-owned cooperative involved in the entire dairy industry value chain.

Development Issues and Risks

Number of beneficiaries: Likely to be relatively low at least in the short-medium term (5 years).

Impact on Poverty: High at a household level, but participation is likely to be limited to relatively resource rich farmers. One issue is that a small number of beneficiaries could capture almost all benefits (although there may be downstream benefits available to a greater number).

Investment Requirements: High per direct beneficiary and some issues with equity and gender in this concept.

Value Chain: Exists, but embryonic. No cool chains but adequate collection systems, provided catchment is not too great. Development requires significant investment in equipment to scale up simple processing facilities. Milk consumption promotion should enhance demand.

Critical Success Factors: Availability of land in a contiguous area and longer-term usufruct land rights/security. Investment in livestock is capital intensive and scaling up probably requires some sort of livestock bank or equity sharing approach. Management of cost through low liveweight cows, high proportion of home-grown forage and high health management systems. Opportunities for specialist forage producers selling forage to specialist milk producers to enable them to increase herd size will be important especially where land holdings are small and insecure. There will also need to be some input into regulatory (food safety) issues to ensure that raw milk of low quality and likely to contain a range of bacteria and somatic cells (e.g. mastitis) is not available in higher priced formal markets (e.g. supermarkets).

Fruit and Vegetable Value Chain

Background and Rationale:

The Ministry of Agriculture and Irrigation is focused on rice production and irrigation and although fruit and vegetable production is a priority, it does not receive much attention. From the NZ perspective the agronomic and value chain experience has much to offer but unlike NZ the producers are small, fragmented and constrained by physical access to markets and access to market signals. Observation of local city and township wet markets show two key issues: (i) the low quality and shelf life of fruit and vegetables; and, (ii) high levels of imports (especially fruit). Visits to supermarkets confirm the low quality and attractiveness of local product, but in some of the larger supermarkets it is evident quality is much higher and there are significant price premiums. Discussions with various actors identified a small number of specialist value chain players, who contracted farmers to produce (specific products to a minimal standard) and to manage a distribution network with a supermarket chain (City Mart). Clearly there is a local market, and premiums for quality locally produced fruit and vegetables albeit a relatively small one. This market is likely to grow as income per capita and disposal income grows.

The vegetable production system is characterised by mass plantings of common crops in favourable growing seasons, major price fluctuations and reportedly low profits or even losses by producers. Farmers are risk adverse and generally do not purchase high quality seeds or planting materials, are not aware of seed borne diseases, and generally practice relatively poor agronomic techniques. Post-harvest management is absent, there are no cool chains as in most production areas there is no electricity. Most farmers market locally as transport is expensive and often unreliable. In spite of this some farmers are producing vegetable under contract for wholesalers who supply the hotel and specific supermarkets. The quality of this product is noticeably higher and there are price premiums. It is reported that even in local wet markets, while price premiums are not usually evident, the higher quality product takes less time to sell, a greater proportion of product is sold and at the end of the market day, unsold product is heavily discounted.

Indications are that many different varieties of fruit can be grown in Myanmar. In the Central Dry Zone, especially at higher altitudes even temperate fruits such as apples grow reasonably well. However local fruit production does not compete well with imported fruit from China. It is generally small, the varieties grown are inferior, and agronomic techniques such as water management,

fertiliser application, pest and disease management, pruning and crop loading are not common. Harvest and post-harvest management is absent.

New Zealand knowledge, skills and technology could provide the necessary impetus to deliver significant impacts, especially in the fruit industry.

Potential Opportunities

The main entry point that New Zealand could consider is:

Scale up of pilot quality vegetable and/or fruit value chains. The aim would be to build on the embryonic development of crop diversity, improved quality and safety of fruit and vegetable production for hotel and supermarket customers. Fruit is less well advanced in terms of value chain, but the opportunities may be greater as most fruit has a longer shelf life than most vegetables. There may also be opportunities for specific "farmers' market" type selling in the future.

The proposal should build on the work of *Mercy Corps* who have developed a small, but seemingly successful value chain for vegetables and *Proximity Designs*, specifically through micro-irrigation for higher value fruit and vegetables. Technical interventions may include: new vegetable/fruit options, community-based planting schedules, improved varieties seed quality, improved soil, water and fertiliser management, improved pest and disease management and safely of agriculture chemical use, out of season production and improved harvest and immediate post-harvest handling (sorting for quality, washing etc.). For fruit basic agronomic concepts such as pruning and crop loading may be appropriate. The agri-business/farm management capacity of the government research and extension services and farmers is relatively poor and a major farmer-targeted agribusiness learning program is a critical component of any interventions.

The most likely region for this is the *Central Dry Zone*. A rapid rural appraisal during development of a concept would need to be more specific on the Region/State, Districts and Townships.

Potential Partners in Myanmar include:

1) *Ministry of Agriculture and Irrigation:* Department of Agriculture (Planning, Farm Advisory Service and Research Centres)
2) *Mercy Corps:* An international NGO. Country Director, Mr Paolo Cerati. This NGO has established a wholesale marketing operation, developed the existing contract production and value chain approach for vegetables and has good linkages to supermarkets and clients requiring higher quality/safe vegetables.
3) *Proximity Designs:* Location of existing treadle pumps and use of Farm Advisory Service.
4) *Union of Myanmar Federation of Chamber of Commerce and Industry:* In particular the Myanmar Fruit & Vegetable Producer & Exporter Association.

From observations the INGO with most experience in fruit and vegetable value chains is Mercy Corps. It would be a logical candidate as the lead implementing agency. Mercy Corps has a good record with the Ministry of Livestock and Irrigation and appears to have good networks at the township level where the interventions are most likely to be successful. The Ministry of Agriculture and Irrigation is a key partner, but all ODA agencies contacted were concerned about the timely flow of funds and bureaucratic approach to aid delivery (e.g. inability to pay staff for costs associated with delivery of services in the field). The technical complexity involved in this intervention is not high. Low cost but highly effective farm and crop management systems will probably be most effective. Plant & Food Research is a potential partner, but the most likely successful delivery would be provided by NZ based consultancy companies. Potential Service Providers from New Zealand include:

- Agribusiness Group
- AgFirst
- Lincoln University

- Plant & Food Research

The Agribusiness Group in partnership with the Horticulture and Rural Development Departments of Lincoln University could be a useful service provider.

Potential Impacts and Timing

In terms of farm income the benefit is likely to be significant. Already farmers receive premiums for higher quality vegetables provided the margins along the value chain are fair and transport costs are not too high. For vegetables the benefits are likely to be obtained from one growing cycle, although initial investment costs are likely to impact on profitability until at least 2 to 3 growing cycles (6 months). Currently there is no cool chain so selection of vegetables will need careful consideration and management techniques that will reduce field heat may be useful. Shelf life may be an issue but it is expected that many of the vegetables will have a relatively long shelf life (e.g. garlic onion, chili, capsicums, potato etc.).

For fruit it is likely that it will take 2 to 3 years before substantial benefits are seen by producers. However in the longer term benefits from fruit production are expected to be greater per hectare than for vegetables especially if intercropping is practised.

For New Zealand it is difficult to see significant benefits from this opportunity. Development of a coordinated marketing approach incorporating NZ product is unlikely especially in the foreseeable future. There may be limited opportunity for equipment (such as that used for protected production) although in the short term few farmers will be able to afford it. Development of the cool chain may in the longer term provide some potential, but the market size for equipment is very small.

Investment

It is expected that over a 5 year timeframe an investment of $3-4m would be appropriate. Initial support could include introduction of new varieties, agronomic skills development, particularly plant nutrition, basic tree management such as pruning, pest and disease management, market facilitation and development of small scale infrastructure such as packhouses and possibly initiation of a cool chain. The principles of Good Agriculture Practice would be important and there may be some assistance to GoM in development of regulations for Myanmar GAP certification (as is practiced in other Asian countries).

Medium Term Vision

A strong value chain for fruit (especially) and vegetables focusing on high quality and safe product for niche markets. With the opening up of Myanmar it is expected that tourism will boom and with that together with the development of a middle class, especially in major cities, the market requirements for such products will significantly increase. The value chain structure will be built on a relatively large number of producers (3-5000), working in groups (modern cooperatives) under contract production systems that deliver market requirements, in terms of volumes, variety, quality and continuity of supply. Development of intensive covered production systems and use of micro-irrigation are interventions that are likely to assist in achievement of the vision.

Development Issues and Risks

Number of beneficiaries: Likely to be relatively high, but prospects of individuals on their own to participate is extremely limited.

Impact on Poverty: Low-Moderate at a household level, but potentially higher at community level.

Investment Requirements: Per beneficiary will be relatively low, but affordability of inputs may be a constraint to smallholder producers.

Value Chain: Exists, but rudimentary. As well as quality key issues will be management of market related volumes and continuity of supply.

Critical Success Factors: Organisation of communities with planned planting and harvesting schedules to meet demands; Development of community organisation and management rules and self-regulation. Supply contract management; Interventions such as good pest and disease management use of micro-irrigation and protected production systems are not well understood and will require significant capacity development at producer and support services levels.

Small Ruminants (especially sheep but including goats)

Background and Rationale

In poor rural economies much of the household effort is focused towards attaining family food security. Income generation from this occupation is generally small unless some form of market demand diversification is practised. In poor rural households livestock represent both a source of saving and a source of cash income. Most households manage small livestock (mainly pigs and chicken) on a fossicking, low input: low output basis. Family consumption of these products is relatively high but excess production is sold for cash. In many developing Asian rural economies, small ruminants provide a significantly large proportion of disposable cash income. Smallholder farmers can readily generate cash through sale of live animals and they traditionally use this for unforeseen situations such as poor health, funeral expenses and family/customary obligations and for dealing with immediate expenses like education and access to health services.

There is an active trade in live animals, especially goats and many of these are exported to Malaysia and beyond to meet relatively high demand Muslim markets. Goat numbers in Myanmar are increasing but sheep numbers are declining. There are major environmental issues associated with relatively free range goat grazing systems. The planed LIFT supported intervention has one objective focusing on the formalisation of goat management systems to minimise these impacts. There seems little point for New Zealand to contribute to development of the goat industry; it is better to wait and see what the outcomes are from the planned LIFT supported projects.

One of the reasons given for a reduction in sheep numbers is that the price of wool has dramatically fallen. The cost of shearing and marketing outweighs the return from wool and the current fecundity rates of sheep are less than goats. However there are opportunities to change to tropically adapted high fecundity meat breeds (e.g. dorper breed) and if accompanied by improvements in forage and feeding systems has the potential to provide rangeland farmers with substantial improvements income as the price of sheep and the live trade is higher than goats.

Potential Opportunities

Traditionally small ruminant farmers farm sheep and goats together. Many sheep and goat farmers are landless. Feeding systems include open grazing but often access to this is extremely limited; cutting and carrying of roadside grass; some grazing especially by goats of shrubs and limited supplementary feed systems. As with dairy farming systems the move to grow a higher proportion of the total diet through introduction and micro-irrigation of improved forages the use of feed conservation techniques is essential in the development of this option.

If NZ was to invest in small ruminant production it is suggested that the focus is on sheep. Other planned interventions for goats are already developed, although not yet approved. The farming systems suggested are for existing sheep farmers (most of whom also farm goats). The approach would need to address animal quality, with a move away from traditional breeds that although adapted to local conditions, have relatively low body weights, poor meat quality and generally require shearing (a cost with little return). Artificial insemination is the most practical procedure for introduction of new breeds. There is also an opportunity for applied research to evaluate the introduction of new breeds. As with all improved breeds provision of high quality feed is essential.

Currently most small ruminant farmers have little or no land and rely on access to grazing from roadsides or in some cases around large areas of land owned by government.

The Central Dry Zone is most likely to be suitable for sheep and this is recommended as the target area. There may be some potential for sheep grazing under the extensive new plantings of teak and rubber. However to be successful land usufruct rights are essential. If this is assured then as with the dairy option, the use of simple irrigation technology by *Proximity Designs* and the introduction of high quality forages will assist in providing high quality diets for reasonably high production.

Commodity markets (live sheep sales) are relatively large, but a sound market and feasibility study would be required during the concept/design stage to ensure that domestic markets for meat will pay premiums over live sale prices. There does not appear to be an existing market for quality sheep/goat meat (as there is in the tourist markets for imported beef) and apart from what appears to be relatively small volumes in "local wet markets" the formal meat trade is small. There seems little point in producing high quality sheep meat for these local markets as price, rather than quality drives market volumes. A value adding/niche market approach is considered to be most successful. However value adding to NZ slaughter and processing standards is capital intensive and in the short-medium term the use of slaughter points, development of regulations and compliance regarding minimal hygiene and post-harvest handling would assist sustainability.

Potential Partners in Myanmar include:

1) *Ministry of Livestock and Fisheries:* in particular the Livestock and Veterinary Breeding Department, and including veterinarians and paravets in townships and districts;
2) *Myanmar Livestock Federation;*
3) *Dan Church Aid*
4) *Network Activities Group*
5) *Proximity Designs:* Location of existing treadle pumps and use of Farm Advisory Service.

Observations suggest that the NGOs most suited to implement this project are either the Network Advisory Group (NAG) or Dan Church Aid (DCA). DCA/NAG partnership is the preferred service provider for the proposed LIFT goat improvement project. NAG has a history of work with goat projects in Myanmar.

Potential Service Providers from New Zealand include:

- Agribusiness Group
- AgFirst
- Massey University
- Lincoln University
- AgResearch

As is the case with the dairy project, the technology that would be employed is widely known in NZ and apart from some adaptive research/technology demonstrations, has little research potential. The most likely preferred service provider would be Lincoln University (animal husbandry and rural development faculties). Again a partnership approach is desirable with one of the extension and agri-business service providers if some experience in tropical livestock production systems can be demonstrated.

Potential Impacts and Timing

The timeframe for this opportunity is at least 5 years. It would be expected that up to 10,000 households could be involved in a relatively contiguous area consisting of 40-60 townships. The Myanmar Livestock Federation data shows that there is around 800,000 sheep in Myanmar and that over the years this number has steadily declined. Optimistically if 10,000 sheep raising households were identified the population of sheep in the improvement program would be around 60-100,000 head over a 5 year period. These households would be direct beneficiaries as will staff from the

Livestock Breeding and Veterinary Department of the Ministry of Agriculture & Fisheries. Strategies for developing local extension support including lead farmers and farmer to farmer extension would be developed. Provision of adequate veterinary services, including sheep artificial insemination will also be important and "barefoot veterinary" skills should be in the tool kit of farmer extension workers. In the future some form of "revolving livestock" should be considered to increase the number of beneficiaries and this concept should be fully incorporated into the project design.

Direct beneficiaries should see improvements in production within 12 months from introduction of forage crops and breed improvement. At least a 20% increase in productivity is expected by year 3 and as sales increase this should be reflected in significantly improved income generation from years 3-5 and beyond.

Depending on uptake and scale of improvements it may be appropriate to introduce small modular mobile slaughter facilities connected to a cool chain. Alternatively slaughter points with links to butcheries is major centres might be appropriate. However almost all the direct beneficiaries do not have electricity (at the moment) which means that the prospects for value adding will be significantly reduced. Strategies for producer ownership and management of mobile slaughter facilities should be considered as part of the design.

The best opportunity for NZ benefits (apart from semen initially) is the export of modular and/or mobile slaughter premises. These could be multi-purpose – for small and large ruminants and possibly pigs. Realisation of this benefit may be many years away, and the live animal trade would provide an impediment.

Investment

It is expected that over a 5 year timeframe an investment of $3-4m would be appropriate. Initial support could include introduction of new breeds, development of forage/cut and carry feeding systems, farmer and extension worker capacity building and basic farmer tools and equipment. There may be a need for infrastructure but in the short term it is anticipated that most animals would enter the live animal trade. Without infrastructure the anticipated project cost would be around $3m (or slightly less) and if infrastructure was incorporated the projected cost would be closer to $4m.

Medium Term Vision

Development of a value chain targeting the higher end market in major cities through improved production of introduced sheep meat breeds, simple but effective technologies such as quality forage production using small scale irrigation, supplementary feeding of by-products of the beans and pulses industry, introduction of improved animal health care, development of lead farmers and farmer to farmer extension and potentially much improved and hygienic slaughter facilities. It is expected that due to the nature of the land availability (small areas, insecure tenure) some form of cooperative would be required for both slaughter and marketing. Direct contracts with supermarkets are likely to be the most effective market route.

Development Issues and Risks

Number of beneficiaries: Likely to be relatively high. However most of the farmers farming goats/sheep are landless farmers and because of this capture of benefits could be compromised.

Impact on Poverty: Likely to be high on a household basis as livestock provides the best option for savings and income generation. The overall impact is also likely to be high; this opportunity is likely to have the greatest return on investment of all opportunities at least in the short-medium term, although the time to achieve initial impact is longer than for fruit and vegetables.

Investment Requirements: Relative low on a direct beneficiary basis. Costs will include AI, improved forages, treadle pumps and other inputs such as animal remedies etc. Investment costs for support

services will be relatively large as the sheep population is spread out over a large area and significant training of farmer extensionists will be required in both sheep husbandry and animal health areas.

Value Chain: The live animal trade is active, but hardly represents an integrated value chain. Observation suggests that the value chain for quality sheep meat is at best embryonic and probably does not exist. Significant effort will be required to evaluate the potential and feasibility for development of such a value chain and the potential for mobile slaughterhouses.

Critical Success Factors: Attitude of farmers will be critical. Most small livestock farmers are more familiar with goat production and may be reluctant to invest in sheet meat production for income generating. Land use rights must be sorted out to ensure that potential beneficiaries can produce most of the feed required from their own resources instead of relying on poor quality roadside or abandoned land feed. Access to higher value meat markets with food safety and quality assurance will be required for longer term sustainability.

Moderate Priority

Apiculture

This opportunity has some appeal as it is directed at the poorest of the poor – mainly landless farmers. The Ministry of Livestock and Fisheries, Apiculture Department states that there are around 60,000 bee hives producing 3000 tonnes of honey largely from plants such as jujube, niger and sunflowers. It is stated that the honey produced has a unique flavour. Some observers state that much of the honey produced is harvested through destructive means from wild bee colonies, although this has not been verified. The Apiculture Department has the development of in commercial royal jelly production (i.e. managed hives) by Sinkhaing, Patheingyi, Pyawbwe township apiaries, Mandalay Division as a priority. There will also be opportunities for production of propyls and in the health food markets. The level of investment is low – mainly production of hives, although improvements in productivity will require development of queen bee rearing facilities and re-queening of hives. There will most likely be some requirement for efficient honey extraction equipment and facilities and equipment for value adding (royal jelly, propyls etc.).

It appears that much of the honey produced is exported through 6-7 exporting companies who buy from small and larger traders. The net return for producers was not known, but it is likely to be relatively low per hive. Costs are also not known – it is also likely that hives will have to be fed for significant periods of the year.

The main reasons why this option is considered a moderate priority are:

a) The logistics of managing an improvement project – hives are scattered over a wide area and the number of hives per producer is low.
b) Honey from managed hives is probably augmented by production from wild hives (destructive harvesting) and maintenance of breeding lines in managed hives may be difficult as cross-breeding from wild varieties is likely to be common.
c) This option would be a relatively small project in NZ$ terms, so does not really fit the NZ Aid Program requirement for larger projects.

9(2)(a),
9(2)(g)(i)

Beans and Pulses

Myanmar is a major consumer and exporter of beans and pulses (mainly beans, peas and lentils). Little information was obtained on the volumes, prices and quality of these products, but anecdotal evidence suggests that this is a relatively large volume commodity based trade, with low prices discounted for low quality. However these products provide significant foreign exchange.

The issue with these crops as with other crops is security of land use and the willingness of poor farmers to invest in high health or certified seed and other inputs. Beans and pulses fit into some rice-based farming systems as part of a crop rotation. They are more effective than an additional crop of rice in terms of profitability and use of residual soil moisture.

The main reason for a moderate priority is that New Zealand's experience in beans and pulses is not unique. It is likely that beans and pulses will be a potential development target for many of the bilateral and multi-lateral agencies. This will make it difficult to create an image that highlights NZ's unique contribution.

However the NZ knowledge and skills are at the leading edge and the potential contribution, both in improving yield, quality and value adding would have the potential to improve export earnings and farmer incomes might be significant.

Agriculture Education and Training

The concept of farming as a business is very poorly understood in Myanmar. Production options have for many years now been directed by the state and top down. There is little evidence that straightforward enterprise analysis such as gross margin analysis is understood or used as a basis for farmer decisions on his/her farming system. Similarly there is little evidence of the adoption of a farming systems approach to improving productivity. Value chain analysis and integration/ participation of small holders into value chains are foreign concepts in Myanmar.

New Zealand, particularly Lincoln University is a world leader in these fields. It has developed twinning relationships with agriculture universities in other countries and the long-term benefit of undertaking a similar approach in Myanmar is likely to be very large.

The main reason for this option falling in the medium priority category is that it will take a long time for results to become apparent. While the scoping mission did not visit Yezin Agriculture University (a department under the Ministry of Agriculture and Irrigation) there is little evidence that recent graduates have a sound knowledge and skills in farming as a business. The time taken to undertake a curriculum review and restructure will be relatively long. Almost all academic staff will require significant training to strengthen their knowledge, skills and teaching practices and the number of students with basic under-graduate diplomas will be relatively low and even fewer with graduate and post-graduate qualifications. It will take about 10 years from project initiation before a reasonable cohort containing appropriate knowledge and skills will be available. The project would need to assist in the development of relevant education curriculum, training modules for farmers and service providers, and the development of a case study approach to build farm management skills. The impact at the farming level will take a considerable time. *However if a very long term investment in agriculture and rural development is considered appropriate a well prepared project for agriculture education and training is likely to have the greatest long term impact on the agriculture sector of all opportunities identified.*

Lower Priority

Agriculture Policy and Regulation Development

As with other Asian countries, the development and implementation of good agriculture policy helps to develop an enabling environment for significant advances in agriculture production and rural development. Myanmar now is where Vietnam was before *"doi moi"* with all land use controlled by the state. There is little prospect of significant improvement in agriculture's contribution to food security, nutritional quality and export income without similar major policy changes (Vietnam is about to go through a second major agriculture land-use policy change). Nothing much will change and investment by farmers in improved agricultural practices will lag without security on land use.

Similarly there are major policy changes required relating to the ability of farmers to make decisions on land use, policy and regulatory changes in water use, sanitary and phyto-sanitary and food quality

and safety and the management on natural resources. The challenge is large as almost all agriculture and rural development policy and regulatory framework needs to adopt a "blank page" as a starting point for reform.

The Asian Development Bank (ADB) has recently completed a scoping study focusing on reform in agriculture. It is likely to develop a very large programme over the coming years – possibly hundreds of millions of dollars lasting for at least 5 and potentially 10 years. In such programmes the ADB traditionally relies on bilateral donors to fund specific technical assistance. This would be an opportunity for some NZ based individuals or organisations to contribute.

This opportunity is ranked as low priority for the following reasons:

a) The ADB Programme is unlikely to be initiated before 2014.
b) Provision of technical assistance within such a programme will not be immediately obvious as a contribution from NZ. Rather the recognition will be with ADB and not the NZ Agriculture Diplomacy Flagship.

5. Conclusions

The current operational environment for ODA in Myanmar is challenging. Major issues in relation to land use rights are likely to significantly reduce the ability and willingness of farmers to invest in improved technology, farming systems and farm management practices. Traditional supply chains in Myanmar work, but the efficiency of these and the opportunity for participating farmers to receive a reasonable price or to participate in improved value chains are limited.

Nevertheless a lack of engagement at this time is not the answer. There is a real opportunity to take a significant role in the restructuring of agriculture in Myanmar and through that provide a significant impact on food security, food safety, nutritional status and rural poverty levels.

While there are a number of opportunities for NZAID support to agriculture and rural development in Myanmar through the agriculture diplomacy flagship only three are considered potentially suitable for taking to the project concept stage. These in priority order are:

1) Small-Scale Semi-Commercial Dairy Production & Value Adding;
2) Fruit and Vegetable Value Chains;
3) Small Ruminant Production (mainly sheep)

Discussions with Government of Myanmar officials have confirmed that these 3 options lie within their priorities for development of the agriculture sector.

Annex 1: Schedule & Persons Met

Date	Activity/Organisation	Key Contacts	Position	Phone	email
May					
28	**Travel Christchurch Auckland-Singapore**				
29	**Travel Singapore: Road to Nay Pyi Taw Visit Proximity Designs Farmer with treadle irrigation**				
30	**Briefing NZ Aid Program Staff – scheduling meetings with GoM Ministries**				
31	**Ministry of Agriculture & Irrigation** **Department of Agriculture** **Zawana Road, Nay Pyi Taw Building 15** **9567408046**	U Kyaw Win U Than Kyaing U Aye Tun Plus 4 other	Director General Director, Project Planning & Evaluation Director Plant Protection	9(2)(a)	9(2)(a)
	Ministry of Livestock & Fisheries **Pannita Road Nay Pyi Taw. Building 36**	Dr Myint Than Dr Myint Thein Dr Pyae Sone Myo Thet Shwe Plus 3 others	Director General Director General, Livestock & Breeding General Manager, Livestock feedstuff & Milk Products Managing Director Livestock Feedstuff & Milk Products		
June					
1	**Livelihoods & Food Security Trust Fund**	Andrew Kirkwood	UNOPS | Inya Lake Hotel, Yangon, Myanmar 37 Kaba Aye Pagoda Road, (Rangoon) Yangon, Myanmar		
	Network Activities Group	U Bobby	No 70 Room 403 Yaw Min Gyi Condo, Yaw Min Gyi Street, Dagon Township Yangon		
2	**Saturday Scheduling meetings**				
3	**Sunday – outline of report**				
4	**Food Security Working Group**	Dr Ohnmar Khaing	Room (205), Tower (B), 2nd Floor, Diamond Condominium, 497 Pyay Road, Kamaryut Township, Yangon 11041		
	FAO	Ms Bui Thi Lan	Seed Production Centre, Insein Road, Yangon Long way down!		
5	**Oxfam**	John Prideaux-Brune Country Director	West Shwe Gone Daing St Bahan Township (Off Wizaya Rd)		

9(2)(a)

		Josie Buxton deputy director	
	Save the Children	Kelland Stevenson	Wizaya Plaza (bank) 226U Wisaya Rd
	CARE International	Brian Agland	17A Pyi Htaung Su Street, North West Sayasan Ward Bahan Township
6	**DFID Burma**	John Hansell, Livelihoods Adviser	c/o British Embassy 80 Strand Road Rangoon
	Proximity Designs	James Taylor Debbie Aung Din Taylor San Zin Oo (Gugu)	New University Avenue Building C Suite 202 (off University Av)
7	**Dan Church Aid**	Jonas Noddekaer	No 666(B1) Mya Kanthar St, Kamaryut Township
8	**Pyoe Pin Programme**	Gerry Fox Siusue Mark	British Council 80 Strand
	Myanmar Livestock Federation	Dr Hla Hla Thein	Blg 53 Room 9 Nilar(2) Saw Bwa Gone Cargo Terminal Compound
	Resources Development TL	Dr Khin Hlaing	Cnr Bayint Naung Rd & Set-Hmu Say-Wah Road, West Gyngone Insein Township
	Mercy Corps	Paolo Cerati	87c Kan Street 10 Ward Hlaing Township
9	**Golden Plain (Agribusiness group)**	Kywe Htay	No 14B 1st floor South Myin Pyang Kwin Road Tamwe Township
	Walco Dairy Processing Company	Dr Khin Hlaing	20(A) Mya Nandar Street, Myathida Quarter Mingalardon Township
10	**Silver pearl Dairy Farm (160 cows)**		Mingalardon Township
	Armen Farm (400 cows)		Mingalardon Township
11	**AusAID** **ACIAR managed from Thailand**	Michael Hassett 1st Sec Jillian Ray Livelihood Adviser	88 Strand Road Yangon
12	**Travel Yangon – Bangkok**	.....	
13	**Travel Bangkok – Christchurch**	.....	
14	**Arrive Christchurch**	.....	

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Annex 2: Potential Opportunities: Myanmar Scoping Mission

Opportunity	Strengths/Opportunities	Weaknesses/Risks	Issues	Fit & Comments	Priority
Fruit & Vegetable Value Chain	Moderate priority for Myanmar Most fruit in supermarkets imported Some contract production for high value markets – especially vegetables Almost all fruits grown in different agro-economic zones	Low quality poor shelf life of fruit Fragmented and small producers, often with little opportunity to improve production and quality Little awareness of market needs and little premium for quality	Land use rights are tenuous Scattered production Little market organisation or marketing strength Poor agronomic skills and harvest and post-harvest handling Market access constrained by poor infrastructure and no cool chain	NZ has good and appropriate skills in variety improvement, agronomic practices and harvest and post-harvest technology Would be a good example to use for building farming as a business capacity and value chain improvement	Medium-High
Dairy	High Priority for Myanmar – import substitution Majority of cows located in Central dry zone Potential access to water and environment for production of fodder on a small scale seems adequate	Milk consumption per head is low and no strong milk drinking culture Small numbers of milking cows Structure of industry built around small number of large herds and large number of herds with 3 to 5 cows Cut and Carry systems to tethered animals Low milk production levels, high feed costs and extreme competition from unregulated dairy imports.	Larger feedlot type management systems have severe environmental issues relating to waste management. Smaller herds dispersed over wide areas regulation and compliance in relation to processing needs significant strengthening No cool chains in place with limited and low quality processing and value-added systems. Lack of electricity in rural areas. Dairy industry built on large potentially high producing cows, but feeding systems are high cost and feed quantity and quality insufficient to deliver genetic potential.	NZ dairy farming systems not particularly appropriate but technologies could be adapted to small scale dairy production models. NZ Technology for initiation of cool chain where electricity is unavailable may be appropriate. Opportunities for breed improvement through AI and for improved forage and forage conservation systems using NZ technology and systems.	Medium-High
Small Ruminants	High priority for Myanmar Relatively good markets for live animals Farmer experience in herding and foraging production systems and in animal health Change from dual purpose breeds to meat breeds Small livestock is a relatively low cost option for significant improvement in income and household financial security	Sheep numbers falling due to very low wool process Most farmers are landless and use roadsides or vacant land for grazing Low production levels largely due to poor nutrition Reliance on live animal trade and no farmer organisation means low prices	Insecurity of land tenure makes it difficult to improve feed availability and quality Low production levels due to poor breeding and nutrition Farmer cooperation for market strength is limited. Relatively high animal health risk	Good skills and experience in small-scale sheep rearing Good animal improvement skills through breeding, introduction of forage grasses/legumes and excellent sheep husbandry skills	Medium-High
Apiculture	Is the only form of income for some landless farmers	Good honey markets (export) Farmers familiar with honey	Prices and quality of honey uncertain Export trade dominated by a few large	Good NZ skills in all areas of apiculture	Medium

	Relatively high priority for Myanmar Significant opportunities for adding value – propyls, royal jelly etc. Improvements in hive extraction rates and quality of honey will make a difference if price premiums can be obtained	production systems and are harvesting honey from destruction of wild hives Extremely complicated supply chain with many intermediaries	exporters and prices to producers relatively low Difficult to maintain bee quality through invasion of hives by wild bees Little or no improvement through introduction of quality queen bees and introduction of queens relies on importation	Will be a relatively small cost project and as such could give good experience of working within Myanmar and improve the prospects of success of future NZAID support	
Agriculture Education & Training	Probably will have the biggest long term impact on agriculture's contribution to GDP	Very poor knowledge and skills relating to farming as a business, analysis and improvement of value chains and use of enterprise analysis to assist farmers in decisions on production & farming systems	Only 1 agriculture university under the Ministry of Agriculture and Irrigation Difficult to judge the quality of graduates, but few young skilled service providers (research and extension) are in government agencies	NZ (especially Lincoln University) is a world leader in this area and understand its potential contribution to smallholder agriculture farming systems	Medium
Beans & Pulses	Relative large existing export markets Basis agronomic skills are practiced Potential to significantly improve yields, quality and value	Fragmented production Relatively low yields and poor quality Export is based on volume not price and Myanmar prices are at the low end of international price ranges	Poor land use rights Top-down instructions to grow – often on marginal lands Not enough use made of rice fields during fallow periods between rice crops	Not especially a good fit for NZ as many other countries have good experience and are probably more familiar with tropical environments	Medium-Low
Agriculture Policy	It is unlikely that sustainable improvement in agriculture productivity will be achieved without important policy changes Large ADB project likely to address a wide range of agriculture policy issues	Needs to be greater awareness of the importance of good enabling policies Currently little in-country capacity for policy analysis and development	Regulatory frameworks are weak and those that are in place need strengthening to ensure better compliance	NZ has good skills, but the task is too big for NZ to undertake. Opportunities to provide TA under the proposed ADB project but recognition for NZ inputs unlikely to be realised	Low