

FEASIBILITY OF ESTABLISHING BREEDING AND FEEDLOT OPERATIONS IN TIMOR-LESTE USING IMPORTED NT CATTLE



Droughtmaster cattle near Baucau (2001)

Visit Report



Northern
Territory
Government



Summary

Following discussions between NT Government Department of Primary Industry and Fisheries (DPIF) and representatives from the Government of Timor-Leste, it was agreed that DPIF Officers would travel to Timor-Leste (8-12 September 2014) to assess the feasibility of establishing breeding and feedlot operations using imported NT cattle.

The DPIF Officers travelled with the Darwin-based Consul General of Timor-Leste and Secretary of State for Administrative Decentralisation to the south coast of Manufahi and Manatuto Districts and met with local communities and visited possible feedlot sites. They also inspected proposed sites for new ports and viewed a ranch near Barique for cattle breeding. In Dili, they visited the Tibar Abattoir, meat shops and a livestock trader's operation and a livestock enterprise near the town of Manatuto .

Consideration was given to prospective markets, issues relating to Australian export regulations (ESCAS), infrastructure (ports and roads), operational needs to produce a high quality beef product and training of workers. While there are many obstacles to overcome the establishment a viable beef enterprise with imported NT cattle would be feasible by targeting a high volume cold chain market with high quality beef to HACCAP and ISO 9001:2000 standards, supported by sufficient development funds, on-going technical assistance and training, and professional management.

A four stage project development proposal is outlined beginning with a 12 month Pilot in which a Central Feedlot and Abattoir is constructed and the first shipment of 500 cattle is delivered. Stage 2 involves further shipments and building of community-based Satellite Feedlots. In Stage 3 the Central Feedlot may be expanded as the market develops and Stage 4 introduces a breeder component. Design concepts for the Central Feedlot and Abattoir have been presented together with estimated costs based on similar facilities built elsewhere.

Implementation of this project will require further discussion between national and local authorities, and possible interested parties from NT. It is recommended that an experienced project manager is recruited during the implementation stage.

The proposed breeder ranch was deemed unsuitable for imported NT cattle due to the steep slopes and very low carrying capacity of the native pasture with very low potential for improving beef production. The livestock enterprise near Manatuto was extremely overgrazed and covered with weeds. It was recommended to implement a weed control program and to fence areas of grass to enable better grazing management of livestock. The installation of a drinking watering system nearer to the grazing areas will reduce the need for animals to walk to the river daily.

Visit Report to Timor-Leste (8-12 September 2014)

Terms of Reference

- Inspect proposed sites to determine suitability for potential breeding/feedlot operations.
- Assess geographic, climatic and feed/water resources required for NT cattle used for breeding/feed-lotting.
- Inspect ports and abattoir to determine suitability under ESCAS regulations.
- Develop proposal for establishing a breeding/feedlot operation using NT cattle.

Background

In November 2013, the Darwin-based Consul General of Timor-Leste, Mr Francisco Jose Filipe contacted the NT Government Department of Primary Industry and Fisheries (DPIF) about establishing a beef cattle industry in Timor-Leste using land procured by the government for ranching Australian cattle. In response, one of the suggestions made by the Department was to undertake a feasibility study of establishing a feedlot and processing facility using Australian cattle to supply high quality beef product to upmarket hotels and restaurants.

On 29 July 2014, DPIF met with a delegation from Timor-Leste, headed by the Secretary of State for Administrative Decentralisation, Mr Tomás Cabral, accompanied by the Darwin Consul general. At the meeting the suggested feasibility study was discussed and it was agreed that officers from the Technical Services Program would undertake the study in early September 2014.

There is a strong push by the Timorese Government for administrative decentralisation and creation of regional employment opportunities. The municipality of Manatuto is one of the districts with high production of cattle and buffaloes and good cropping alluvial soils in the southern coastal areas and the climate is appropriate for tropically adapted cattle such as the type of commercial cattle (such as Brahman and Droughtmaster) exported from the Northern Australia. The municipality has already drafted an integrated livestock project to attain self-sufficiency and become a high-value food processing and leather industry to create new opportunities for business and employing many skilled and semi-skilled people.

The ownership of cattle and buffalo in Timor-Leste is mostly for basic subsistence and social cultural purposes. In Indonesian West Timor, the shift to commercialisation of livestock ownership is gradually happening after many decades of projects implemented by Central and provincial governments, and foreign aid and NGO programs (eg Pusat Koperasi Unit Desa (Puskud) NTT). The planned development of a complex of projects on the south coast that include a supply base at Suai for offshore petroleum operations, an LNG plant, and a petrochemical complex along with associated infrastructure, provides an opportunity to supply high quality beef to large numbers of expatriate workers involved these projects as well as to upmarket hotels and restaurants, and towards substituting imported beef.

The objective of the feasibility study is to look at the potential for establishing a closed supply chain of Australian feeder cattle for finishing to the above market requirements in a feedlot over a 90-120 days period followed by slaughter and processing. Under good management Australian commercial cattle have the advantage of growing faster and producing high quality tender beef suitable for western cuisine compared with local 'Bali' cattle. This project will employ and train local people in the feedlot and beef processing operation and is not likely to impact on the local beef market due to the difference in end product. Due to limited time of the visit it will not possible to do a full economic analysis for this feasibility study.

Visit Program

DPIF Officers Dr David Ffoulkes and Mr Barry Lemcke, together with Darwin-based General Consul for Timor-Leste, Mr Fransico Felipe stayed in-country from 8-12 September 2014. Accompanied by the Secretary of State for Administrative Decentralisation, on Day 1 and 2 they visited the villages of Alas and Foho Inglês (Manufahi) and Natarbora (Manatuto) to speak to communities about the study and inspect possible sites for the feedlot and abattoir. They also looked at the ranch site at Barique (see Appendix 1), and proposed port sites near Natarbora and Manatuto. On Day 3, they visited a farm at Fatu Bela near Manatuto (see Appendix 2) and on Day 4 they inspected the Tibar abattoir, meat shops and a trader's livestock sale yard in Dili. During their stay in Dili, they met with John Doyle, Seeds of Life and David Boyce, USAID.

Considerations

Market

The Timor-Leste Government has identified the Tasi Mane Project with the establishment of the Suai Supply base for the petroleum sector and the Liquefied Natural Gas (LNG) at Beço (Viqueque) as potentially major markets for high quality prime beef cuts to feed a large contingent of expatriate workers (see map below). The hotel and restaurant market in Dili which imports around 200 tonnes of beef per annum also presents a market opportunity.



[Tasi Mane Project market opportunity. Source: Timor-Leste Strategic Development Plan 2011-30](#)

Prices of local cattle ready for slaughter are around USD 2.73/kg LW and carcass price is USD 7-8.00/kg. The landed price of NT cattle is likely to be about AUD 3.00/kg LW (or USD 2.79). The gross added retail value of the Australian cattle after 90 days in the feedlot is estimated to be USD 1,450 compared with USD 1,200 after 15 months for local cattle. Although input costs are higher per head in a feedlot operation, there is a much faster turnover of slaughter stock and feed costs are much lower when the forage component of the ration is cultivated on site.

ESCAS

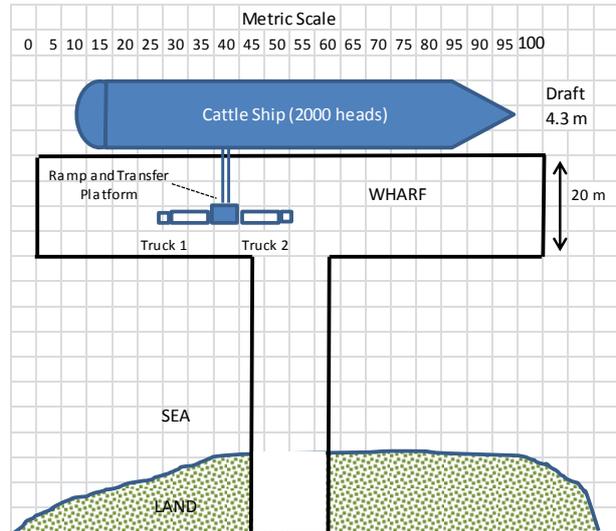
The Exporter's Supply Chain Assurance System (ESCAS) is an Australian Government regulation to ensure high standards of animal welfare for livestock exported from Australia. The regulation covers Discharge (unloading from ship), Transportation, Unloading (at feedlot), Feedlot Management, Lairage (pre-slaughter management), Slaughter and the traceability of cattle through the supply chain. A major component of ESCAS is the training of livestock workers in Handling of Cattle.

Under the regulation, the cattle are traced through the supply chain using electronic ear tags and the exporter arranges independent audits of each component of the operation. The audits and traceability results are assessed by the Australian Government Department of Agriculture and any serious breaches of the regulation may prevent further export permits from being issued. It is therefore preferable to operate a closed supply chain in order to better control the implementation of the ESCAS regulation. This means that the cattle cannot be sold into another supply chain but remain within the operation and electronically monitored at the feedlot and abattoir, with mortalities prior to slaughter recorded by a certified veterinary officer.

Infrastructure (Ports and Roads)

Currently Dili port is the only facility capable of unloading a cattle shipment. Plans to build new ports near the Manatuto township and on the south coast are designed for unloading barges and do not include a wharf for docking ships.

Cattle ships require at least 20 m width of wharf space for cattle trucks to pass the ramp and a 2-way transfer platform used to unload cattle from the ship into two trucks (See Illustration right).



Minimal wharf dimensions for unloading small cattle



Transfer platforms used in Vietnam and



Small cattle ship (1,500 head capacity)



Satellite photo of Nha Trang port, Vietnam

Report by David Ffoulkes and Barry Lemcke,

NT Government of Australia Department of Primary Industries & Fisheries, Darwin (Sept 2014)

There are also plans to improve the roads connecting the north and south coasts. The current roads are very twisty and steep and in a poor state of repair; truck drivers would need to travel very slowly to ensure the cattle do not fall. It is estimated that it would take about 5 hours with careful driving to transport cattle by truck from Manatuto to Natarbora on the current road.

Achieving High Quality Beef Product

Cold Chain: A cold chain is a temperature controlled supply chain from carcass processing, storage and distribution to market. Chilled beef provides the best quality product (as opposed to frozen beef) when stored at around 1-5°C.

Slaughter Method: An effective humane slaughter process using a restraining device and captive bolt stunner and bleeding method under ESCAS regulations will optimise beef quality.

Feedlot Management: Good facilities, quiet cattle and best practice management of the feedlot operation, including balanced rations, plenty of clean water and timely waste disposal, are key factors in producing high quality beef.



Cold chain chiller

Cattle Handling: Understanding cattle behaviour to minimise stress of cattle when they are being handled makes it easier and safer for stockman to work with cattle and ultimately leads to better quality beef.

ESCAS: The application of the regulation not only safeguards the welfare of the cattle but also ensures best practice management towards high quality beef product.

Cropping: The coastal areas of Manufahi and around Natarbora were farmed by Balinese transmigrants during the Indonesian era, and cultivation is well established for crops of maize, rice, cassava and beans.

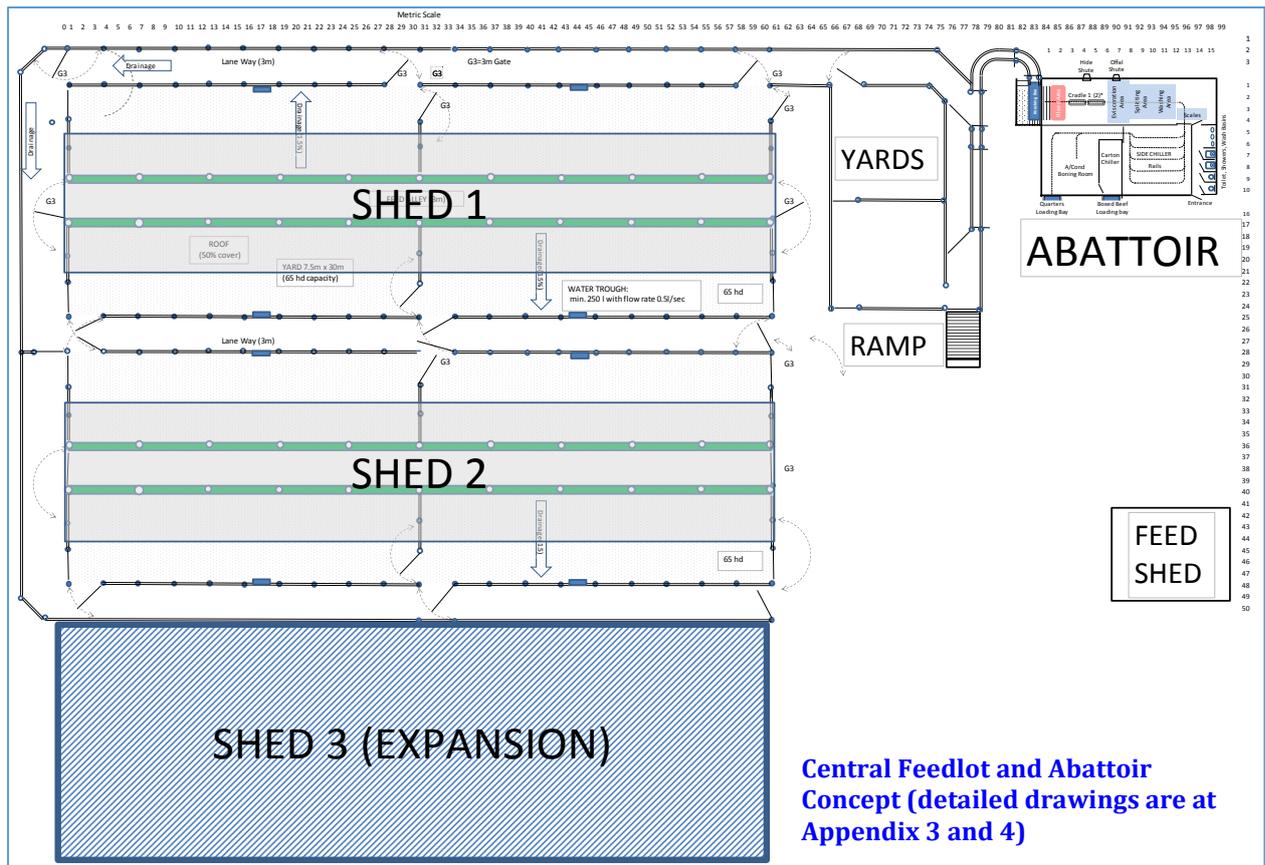
High Quality Operational Management: An enterprise with ISO accredited management and HACCAP certified for food safety with well-trained and organised workforce (sourced from local communities) with specific duties is the best way to operate a supply chain that must consistently produce a high quality and safe food product. There will need to be a strong emphasis on skills training and work ethic to ensure that there is sufficient human capacity to maintain the required standards of the operation.

Proposal

Stage 1: Pilot (12 months)

The first option considered was the establishment of a small feedlot (50 head capacity) in each of 2 or 3 communities, however as a pilot this would be difficult to manage and lacks the critical volume required for a cold chain slaughter and processing operation.

It is therefore proposed to establish a modular Central Feedlot (ie capable of expansion in the future) to house 500 heads of cattle and a cold chain Abattoir with a startup capacity of 15 heads/week (see illustration below and more detail at Appendix 3 (Feedlot) and Appendix 4 (Abattoir)). The indicative costs for local construction and imported equipment in Stage 1 are presented in Appendix 6; the total cost is estimated to be less than USD 1M.



A total cropping area of 35 ha close to the feedlot is required to cultivate 15 ha maize forage and 20 ha of Elephant grass (*Pennisetum purpureum*) capable of yielding 200-400 tonne/ha/year with a nutritive value of 7-10% crude protein. Other *Pennisetum* varieties are King, Taiwan and VO6 grass with similar or better productivity. Cultivation of these crops would need to commence 3-4 months prior to the first shipment of cattle. Concentrate feeds such as cassava, rice bran and leaf meal (from legume shrubs *Leucaena*, *Sesbania*, and *Calliandra*) can be outsourced from local farmers.



Elephant grass ready for cutting



Maize crop

During the construction phase of the facilities, recruitment and training of local people in feedlot duties and slaughter/processing skills would be ongoing using local cattle for demonstration purposes. Occupational Health and Safety, Food Safety, and Animal Handling would also be part of the training for employees.



A feedlot under construction in Indonesia



Shed construction in Vietnam cost USD

The first shipment of 500 feeder cattle (325-395 kg LW (liveweight)) would be scheduled to arrive 6 months into the Pilot stage and both feedlot and abattoir operations would operate thereafter. The objective of the Pilot is to work towards an operation that can feed and process each shipment over a period of 90-120 days and receive a new shipment of feeders every 3 months.

Stage 2: Satellite Feedlots (12 months)

By this stage, local employees have gained experience working in the Central Feedlot and are ready to assist local communities to establish 2-3 small Satellite Feedlots with 50 head (or more) capacity together with sufficient land to cultivate fodder requirements (See Appendix 5 for Design Concept of Satellite Feedlot). When cattle are ready for slaughter they would be transported to the lairage at the Abattoir. Standards of management and monitoring would be subject to the same ESCAS regulations as the Central Feedlot and Abattoir.

During Stage 2, the Central and Satellites Feedlots will aim to turnover a further 600 head for slaughter in 90 days towards achieving the aim of 4 shipments of cattle per year (or total of 2,400 head)



Examples of a Satellite Feedlots

Stage 3: Expansion of Central Feedlots (6 months)

The expansion of holding capacity of the Central Feedlot by 250-500 head will depend on market demand. In the best case scenario, a shipment of 1,200 head every 3 months could be realised after the expansion of the Central Feedlot.

Stage 4: Breeding Component Pilot (12 months)

Cattle breeding operations are more difficult to manage than feedlot operations. It is recommended to pilot a small intensive breeding operation at the Central Feedlot before extending it into the community. The details of the pilot would be developed during Stage 3. A major issue with establishing a breeder herd is security of calves (ie not sold outside the supply chain) and the need to have water and feed continuously available for cows and calves.

Implementation

Joint Venture

It is suggested that the National (source of funding) and Regional Government (operator) form a Joint Venture to oversee the implementation of the Pilot (Stage 1). At some stage thereafter, a Cooperative Enterprise is formed with professional management and a Board consisting of management and community representation.

External Support

- Technical support for implementation of this project is yet to be discussed with NT Government.
- Other players that may be interested in supporting the project are NT Cattlemen's Association and NT Live Export Association.
- It would be preferable to have an on-site Project Manager with Asian experience in feedlot/abattoir operations using Australian cattle. Possible candidates could be sourced through *Asosiasi Produsen Daging & Feedlot Indonesia* (APFINDO) and the above NT associations.

Appendix 1: Proposed Breeder Ranch

The ranch which is located at Kameda near Barique is quite remote and very mountainous. There were very few trees and the area was already heavily overgrazed by local livestock. Some horses were seen and there was plenty of horse and cow manure to be seen along the access roads. The grass was grazed very low with much less than 1000 kg DM (Dry Matter) per ha estimated to be present in the sward. There was a distinct contour grazing pattern plus significant weed presence with multiple species including Billy Goat weed and Siam weed. The grass component was very small.

This area at first sight was deemed totally unsuited for Brahman cattle due to their size and weight. There were many reasons for this lack of suitability including:

1. Slope grade (steepness) of the landscape would cause significant injury and death losses from falls by Brahman cattle when they were attempted to be mustered, particularly when newly introduced into the area. Local Banteng cattle are small and much more agile than the heavier Brahman-type cattle.
2. The grass is currently overgrazed and very weedy, and even with improved management could only support relatively low stocking rates of local cattle because of poor calcareous soils and seasons.
3. Due to steep topography of the area it would be difficult and costly to fencing the area for suitable management conditions.
4. Due to steep topography of the area it would also be difficult to muster cattle for management purposes.
5. Calf mortality from falls would be high within the first 3 days whilst still unsteady on their feet.
6. The high costs of installing reticulating water to all sections of the area.
7. The low carrying capacity of the area, estimated to be greater than 10 hectares per head, would be extremely costly (per head) and uneconomical to establish. It is more preferable to develop an area with much higher potential for beef production in order to reduce capital establishment costs per head.
8. Both access roads have very steep sections which would be very very risky for transporting cattle because of the shifting load weight to the rear of the truck and loss of traction particularly during the wet season. Many cattle could end up falling on the floor at the back of the truck and being trampled by other cattle.
9. The climate is not suitable for Brahmans because of the very cold overnight temperatures.



Ranch near Barique



Steep slopes and low carrying capacity of native pasture precludes this site for Brahman cattle

Recommendation

This area should not be considered as a suitable site for cattle breeding of any breed variety and should be left for more agile small livestock species that can be more easily managed such as sheep and goats.

Appendix 2: Cattle and Buffalo Farm at Fatu Bela, Manatuto

Staff of the Secretary of State for Decentralisation took the DPIF Officers to see a livestock farm near Manatuto. When they arrived at the farm community they were met by a group of people including the younger brother of Secretary of State for Decentralization. Whilst in discussions with the community chief and others, buffalo could be seen coming and going past the living quarters.

The community is situated in quite hilly and very dry country with stony and skeletal soils, where even the weeds were struggling to grow to normal size. The buffalo were in fair to good condition with healthy looking calves considering the long dry season and shortage of visible feed. It is assumed that there must be a heavy reliance on browse feed even though the lower branches of trees near to the settlement were clean of any browse.



Buffalo at Futa Bela

Nearby were the river flats where the main grazing areas were found. These areas were interspersed with jungle vegetation and very weedy sites. On the flats above the wide, flat, gravelly river bed there were open areas for grazing where the grass was very heavily grazed. Here the weeds were very prominent and the only distinguishable sign of plant life. Even the weeds such as Hyptis, Sida, Senna, Bellyache bush and Siam weed (plus many others) were very small and growing only a fraction of their potential size in better growing conditions.



Evidence of overgrazing and weed infestations throughout the livestock farm at Fatu Bela, near Manatuto

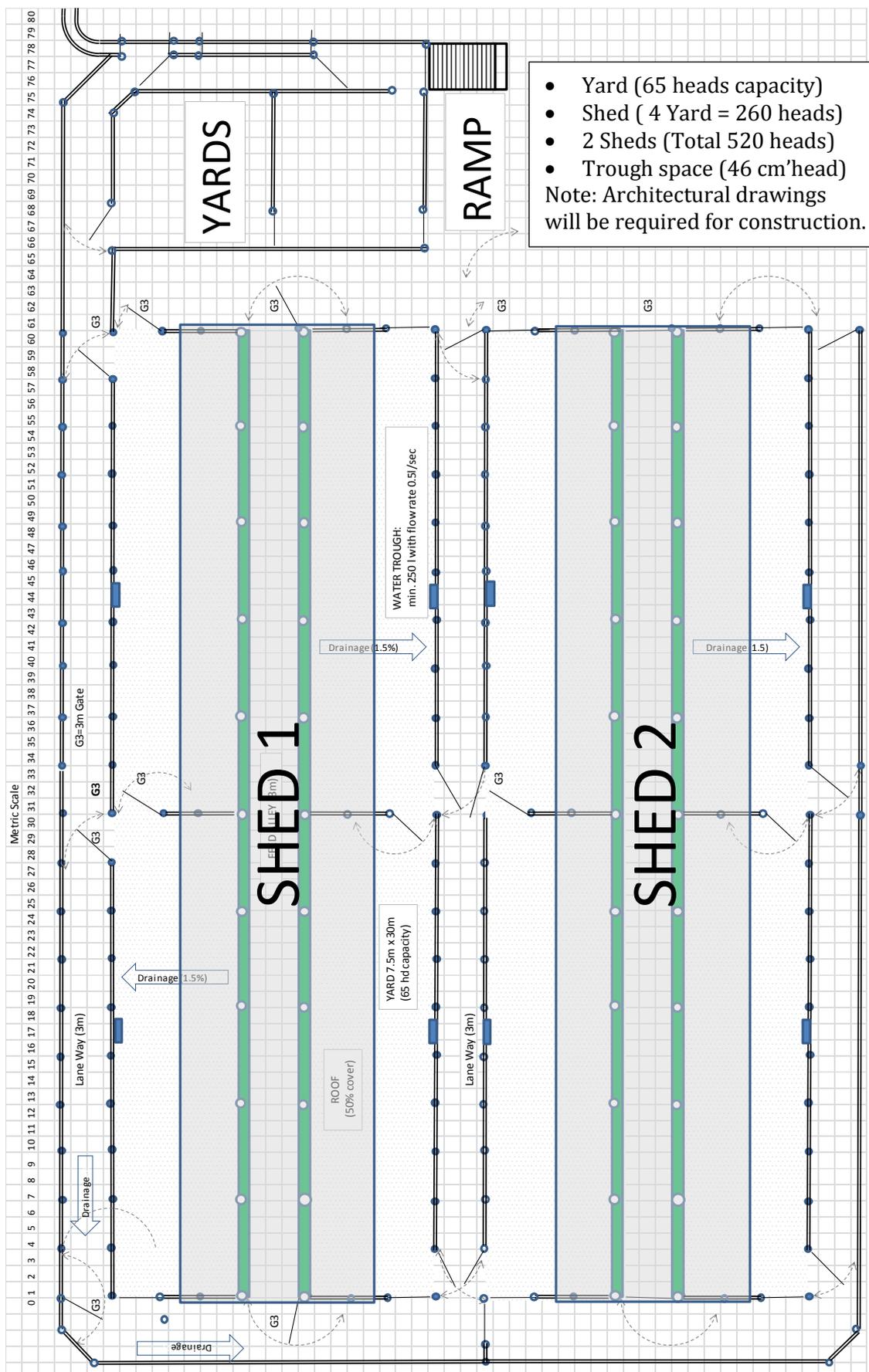
There are likely to be multiple mineral deficiencies in these soils as well as in the water. It was difficult to be able to make any comments or recommendations for this area without any knowledge of these deficiencies. Although it is obvious from the state of the feed supply that the grazing area is over stocked and there is a significant proportion of unusable land due to weed encroachment.

Recommendations

1. Implement a weed control program around the whole farm area to increase the available land for grazing and increase carrying capacity. The areas where the weeds are growing strongest would be the best places to clear first as this indicates better soil fertility.
2. Initiate grazing control by fencing off some of the more accessible areas.

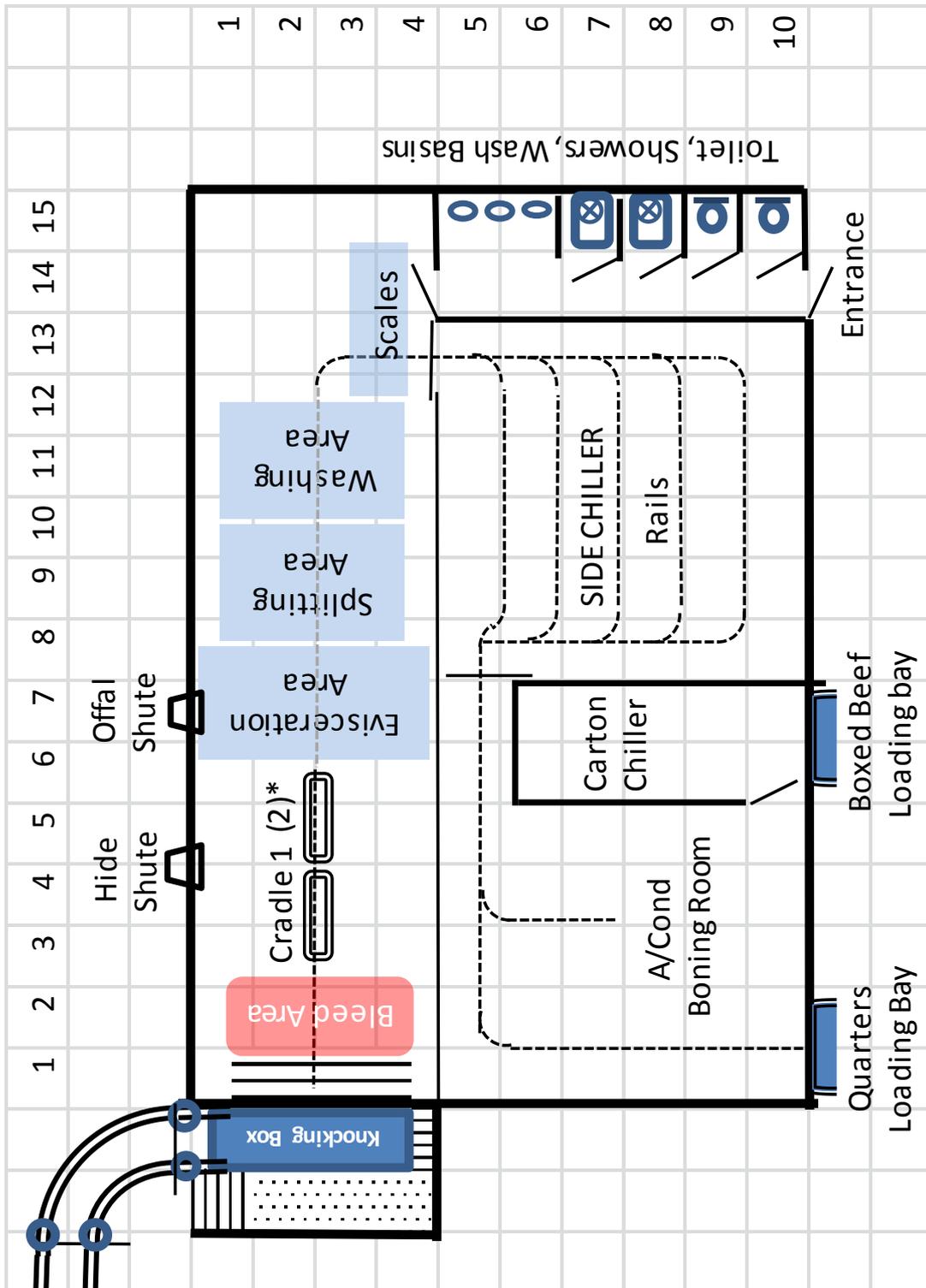
3. Set up an exclusion area with fencing (25m square plot) on a suitable grazing site and implement a mineral deficiency trial as well as planting some suitable grazing species of grasses, legumes and shrub legumes (eg *Leucaena*) to see what might grow be productively in the area.
4. Install a watering system for stock with tank and troughs, using water pumped from the river. This should bring some advantages in weight gain because there is less need for the livestock to regularly walk long distances to get water.

Appendix 3: Design concept for Central Feedlot for 500 head of cattle.

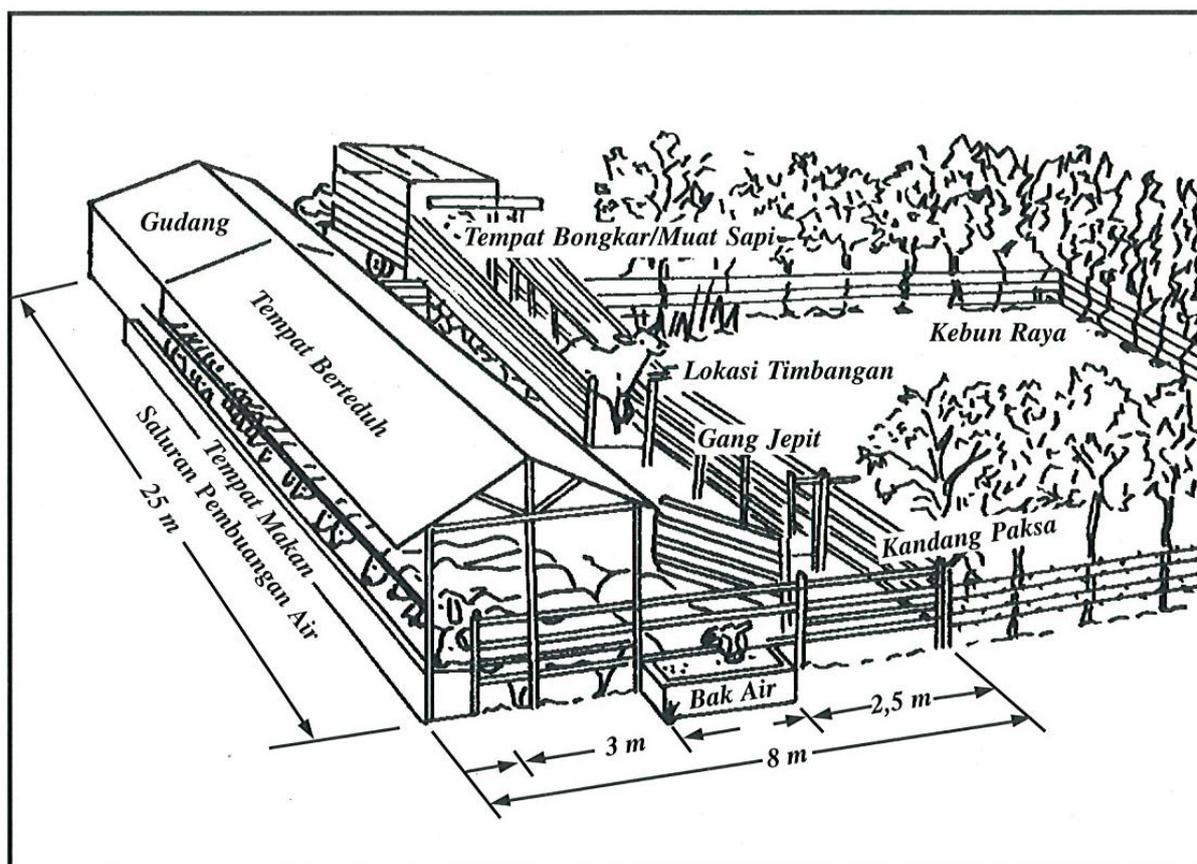


- Yard (65 heads capacity)
 - Shed (4 Yard = 260 heads)
 - 2 Sheds (Total 520 heads)
 - Trough space (46 cm'head)
- Note: Architectural drawings will be required for construction.

Appendix 4: Design concept for a small Abattoir capable of processing 15 head per day.



Appendix 5: Concept design of a Satellite Feedlot for 50 heads of cattle.



Source: APFINDO and AMLC

Appendix 6: Indicative Construction and Equipment Costs (US Dollars) for Stage 1.

Stage 1	<ul style="list-style-type: none"> • 2 x Feedlot Sheds (\$175,000/shed) • Equipment: Forage Chopper (\$600), Tractor (\$30,000), Trailer (\$2,500), Ute (\$25,000) • Yards • Abattoir Building (including knocking box, winches) • Abattoir Equipment: Stunner (\$7,000), Rails/Hooks (\$10,000), Splitting Saw (\$7,000), Ban Saw (\$1,500), Chiller (\$25,000), Small Refrigerated Vehicle (\$35,000) 	<p>\$350,000</p> <p>\$58,100</p> <p>\$35,000</p> <p>\$300,000</p> <p>\$85,500</p>
	TOTAL	\$828,600