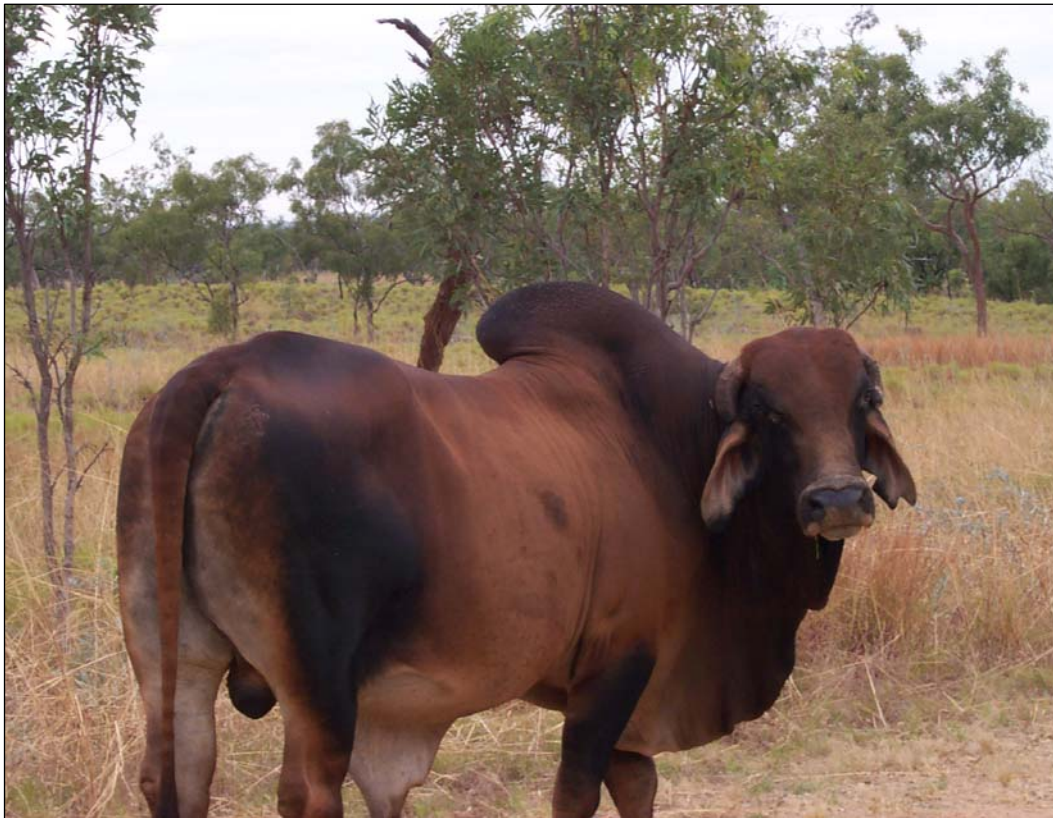


05 Sustaining growth of the northern beef industry

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1. KEY POINTS

1. Large potential is seen by industry leaders to expand sustainable production of beef and cattle in Northern Australia, based on extensive resources of land and water and growing world demand for food.
2. The Australian cattle industry is the world's second largest beef exporter and is worth \$8b pa. One third of the nation's 28m cattle are in northern Australia.
3. The cattle industry is a major contributor to the economy, society and environment of the North, providing 5% of the jobs and covering 90% of the land area. Its expansion can underpin the development of infrastructure, communities, business, services and employment across the region.
4. The northern cattle industry has a track record over several decades as a leader in agricultural productivity growth. Combined with a promising export outlook and water scarcity in the south, this favours continued growth, diversification and value-adding of its production.
5. The further development of the northern cattle industry and any future agricultural, horticultural or energy cropping associated with it depends primarily on increased access to abundant fresh water, both surface and groundwater. At present this is severely restricted by water, environmental and pastoral lease conditions, regulations and legislation.
6. The northern cattle industry produces about 4% of Australia's carbon dioxide equivalent (CO₂-e) emissions. If fully exposed to a Carbon Pollution Reduction Scheme cash income in northern beef properties could decline by up to 20%. Current laws and lease conditions bar producers from engaging in carbon offsets and carbon sequestration, and more research is required into ways to reduce emissions.

2. THE OPPORTUNITY

Leading cattle producers in the Northern Territory, Queensland and northern Western Australia are of a clear view there is scope to more than double production from Australia's northern beef cattle herd. In places, it may be possible to lift output as much as fourfold in value.

Access to water to overcome seasonal feed shortages will enable large-scale cattle raising and finished beef production in areas where stock are now, for the most part, shipped out in the northern live export trade or to southern feedlots as store (unfinished) stock.

The development of northern water resources to achieve year-round feed availability will also open up scope for the production of some grain crops (e.g. maize), energy crops and high-value horticultural crops for export to Asia, creating entirely new industries. This in turn will drive development of northern infrastructure such as all-weather roads, bridges, meatworks, fertiliser plants and port facilities. Based on similar developments, northern communities would then experience general enhancement in the quality and range of government and private sector services, including healthcare and education, and in regional business and employment opportunities.

In short, graziers see potential to increase the value of northern primary production several-fold, to meet rising global demand for food at a time of increasing world scarcity.

3. THE IMPEDIMENTS

Leading cattle producers identify the following impediments and constraints to northern pastoral and agricultural development:

- Lack of detailed information about, and opportunity to develop, Northern water resources – including groundwater – for irrigated pasture, fodder and agricultural/horticultural production.
- Lack of a clear policy for balanced development of the North, which permits primary production to expand sustainably while protecting natural resources, taking advantage of the lessons learned in the Murray-Darling Basin and south. This is seen in an unresolved national and state policy conflict between meeting the needs of developing grazing and agriculture and a desire to maintain a large part of the northern Australian environment in ‘pristine’ condition.
- Lack of all-weather roads, bridges, meatworks and port facilities to cater for expansion in cattle, meat and other primary exports
- Restrictions imposed by lease conditions on the use of pastoral land use for pasture improvement, cropping, feedlotting, horticulture, energy crops and carbon storage.
- Restrictions imposed by environmental and water legislation on water use and other forms of development.
- Insufficient research specific to northern grazing lands into the carbon cycle, carbon offsets, ways to reduce methanogenesis in cattle grazing northern pastures and carbon sequestration opportunities.
- Need for more R&D to reduce chemical inputs, improve animal welfare control pests and enhance general management, so as to keep costs down, raise productivity and cater to growing consumer demand for clean ‘organically-grown’ food.
- Lack of detailed information on the agronomic potential of the north, including soil types, crop types, suitable cropping systems etc to handle the extreme conditions
- Lack of user-friendly technology to evaluate pasture quality rapidly over very large areas, move stock quickly over long distances and so optimise landscape management for grazing output and environmental sustainability.
- Potential impact of ‘peak oil’ on both global fuel and fertiliser price and availability; need for alternative transport energy; lack of information about scope for northern biofuel cropping.
- Risk of global nutrient shortages from 2030s on; need to establish reliable domestic nutrient sources and/or urban recycling.
- Potential shortage of skilled labour, and difficulty in attracting young Aboriginal people to work in the cattle industry.

4. THE NEEDS

To assist in developing the potential of northern grazing and agriculture, leading cattle producers and farm leaders recommend the following:

- A detailed assessment of northern water resources suitable for primary production, both surface and groundwater, their connectivity and rates of recharge;
- Technologies and regulations which enable sustainable development of part of Australia's northern water resources for food production, taking full advantage of lessons from southern Australia;
- Assessment of scope for carbon sequestration in northern grazing landscapes, including new income to offset carbon pollution reduction costs. Transfer of 'carbon rights' from the Crown to land holders to offset cattle emissions. Incentives and opportunities to store carbon;
- Increased research into pasture improvement, feed production, grain production and alternative cropping enterprises suited to highly variable northern conditions.
- Increased research into '21st century pastoralism' remote monitoring and management technologies and systems for northern cattle stations;
- Research into the Northern carbon cycle, ways to reduce methane emissions from northern cattle and ways to offset them through pasture management and/or tree planting;
- Research into 'clean green' cattle production technologies and methods, enabling the industry to target high-value beef markets;
- Improved methods of pest control e.g. cattle ticks and wild dogs.
- Research into alternative transport fuels for pastoral enterprises, including locally-produced biofuels;
- Investigation of alternative domestic nutrient sources for the future, to secure and underpin improved pastures, fodder production and agri/horticultural development;
- Appropriate public investment in bridges, all-weather roads and port facilities to facilitate industry expansion and northern development generally;
- More skilful seasonal and climate forecasts;
- A detailed assessment of future market demand for northern beef, agricultural and horticultural products in the Asian region;
- A plan to develop sustainable northern energy sources (e.g., solar, wind, geothermal, tide) to underpin future industrial and community development in the region, including primary industry;
- Strategies and incentives to re-engage Aboriginal people in the cattle industry;
- A communication/education initiative to explain to Australians the importance of developing the food producing potential of the North, the reasons behind it, and the measures taken to ensure it is sustainable.

5. THE GLOBAL FOOD OUTLOOK

The following factors point to growing insecurity in the global food supply, to sharply increased demand for food, and significantly higher prices, by mid-century:

- The human population will reach 9.2 billion in 2050 (UNPD, 2009). Demand for protein, especially in emergent economies, is growing faster still. Total world food demand is forecast to nearly double 2050 (FAO, 2009).
- There is an emerging global water crisis (IWMI, 2009). Cities will take up to half of the water now used to grow food, while groundwater levels are falling everywhere and major grainbowls are drying. “Current estimates indicate that we will not have enough water to feed ourselves in 25 years time, by when the current food crisis may turn into a perpetual crisis,” says IWMI director-general Dr Colin Chartres.
- The global area of good food-producing land is declining. Cities and non-food uses are occupying prime farm land, 24 per cent is seriously degraded (Bai et al, FAO, 2008) and current losses of about 1 per cent a year pose a serious risk by mid-century.
- The world faces fertiliser scarcity in the medium term as finite resources are mined out and natural gas supplies (used to produce low-cost N fertilisers) peak. The world passed ‘peak phosphorus’ in the late 1980s (Déry, 2007). Global P and K resources are controlled by a handful of countries (eg China, Canada) that may restrict exports to meet domestic needs.
- Worldwide, a half or more of all farm produce and food is currently wasted between farm and end consumer. 20-30 per cent is lost post-harvest and a further 20-30 per cent of the food in shops, restaurants and homes is thrown away (SIWI, 2009). Most nutrients in urban sewage or waste systems are lost.
- If agriculture is forced to rely on farm-based biofuels for motive power as a result of peak oil, this could reduce food output by around 10% in advanced farming systems, and 30% if biofuels were used to transport food to cities (Cribb, 2009).
- There has been a global decline in agricultural science in both developing and developed countries. Current international investment is the same in real terms as it was in the 1970s when the world population was half today’s (Pardey et al, IFPRI, 2006). The impact is evident in declining rates of yield increase in the main food crops. This will reduce technology inflow to agriculture in both the developed and developing world over the coming 20-30 years.
- 29 per cent of global fisheries have collapsed (Worm et al., 2007) and FAO (2008) says “the maximum wild capture fishery potential from the world’s oceans has probably been reached”. This will throw increased demand for protein onto land-based sources.
- The climate is changing. UK Hadley Centre modelling (Burke et al., 2006) indicates 40-50% of the Earth may be in drought by the end of the century, a fourfold increase. Recent predictions indicate harvest declines of 30% for irrigated wheat and 15% for irrigated rice in developing countries, pointing to increased food scarcity and sharply rising prices (IFPRI 2009).

The challenge facing world agriculture is thus to double food output using less land, less water, fewer nutrients, less energy and less technology – in the face of spreading drought.

In such a context the relatively undeveloped pastoral and agricultural opportunities of northern Australia acquire greatly heightened international as well as national significance.

In the context of food scarcity and the growing international 'land grab' (the acquisition by rich and powerful countries of other countries' land for food production) the existence of significantly underutilised food production resources on Australia raises issues of national security and self-determination.

6. HISTORY AND PRESENT STATUS OF THE NORTHERN AUSTRALIA BEEF INDUSTRY

Red meat has been consumed in Australia ever since humans first walked the continent more than 65,000 years ago. The livestock industries began with the arrival of European settlers who brought with them small numbers of sheep, cattle and goats as sources of wool, milk and fresh meat for the new colony. Australia's subsequent history is redolent with tales of 'beef barons', such as the Duracks and Gunns, some of whom who moved large mobs of cattle (>20,000 head) over long distances (*ca* 3000 kms) through harsh terrain to establish the pastoral industry in the north in the 1880s.

Their activities enabled Australians to consume an average of 60 kg of beef per year for the better part of 100 years, the equivalent of a 200g steak every day (except Fridays). For many years, a good deal of this beef came from the north; during the 20th century, about 30% of the live beef cattle in populous southern Australia had walked its way from the north, repeating in reverse the droving feats of the 1880s.

The Australian cattle industry is today the world's second largest source of export beef (1) and the nation's second largest agricultural industry. Its gross annual value of production is \$8b, about half of which is derived from export of about two-thirds of its production. Its 28m head of cattle extend over almost half of the Australian land mass (2). Australia-wide, almost 50,000 people are employed on specialist beef properties, with an additional 20,000 employed on mixed beef-sheep farms.

The red meat industry also contributes *ca* 10% of the total input costs of the national bakery and leather industries and more than 5% of the soap/detergent, hospitality (accommodation, restaurant) and retail trade industries; hospitality accounts for one-third of domestic red meat sales (3). This industrial reach, combined with its large areal and employment footprints, explain why the beef industry influences more regional and rural economies than any other industry (2).

The north carries about 30% of the nation's cattle numbers, mostly via extensive pastoral enterprises of >100,000 ha that are held under crown lease. Collectively, they comprise 95% of the agricultural land use and cover over 50% of northern Australia (4). 75% of the value of Northern Territory's agricultural production is derived from beef (3). Beef may provide as much as 5% of the employment in the north's regional economies, which compares favourably with the mining, construction and hospitality industries, or about 30% of the employment provided by retail and wholesale trade or the public sector (5).

The North produces 80% of Australia's live cattle exports, worth about \$300-400m pa (6). This is a relatively recent development, due to demand for feeder steers mainly in the Philippines and Indonesia. Australia has a comparative advantage in these markets due to its proximity, freedom from foot-and-mouth disease, and a local preference for fresh rather than frozen meat (6).

The industry is also highly innovative by Australian standards, achieving rates of productivity growth averaging 3.6% pa, the highest of any Australian agricultural enterprise group. These have been achieved through major changes in production systems (turnoff rates have increased 40% in 20

years), grazing management (facilitated by investment in fencing) and breeding (a wholesale shift from British-based *Bos taurus* to the better adapted and Asian-preferred *Bos indicus* breeds). Feedlotting is minimal in the northern pastoral zone: animals mainly graze native pastures.

The industry faces several unsolved technical and management challenges. More than 40% of northern pastoral properties report significant degradation due to weeds, averaging >15,000 ha of degraded land per property (7). Waterlogging, wind and water erosion and loss of soil structure are perceived to be a much smaller problem (*ca* 5% of properties identify them as significant). Like most industries, beef has not fully implemented the available solutions; management designed to reduce these problems is typically applied in about half the regions where benefits might be expected (8). Half of all producers are not open to changing management practices (9). The possible introduction of a Carbon Pollution Reduction Scheme (CPRS) poses a major technical and economic challenge to the cattle industry and the North.

6.1 Outlook for the northern Australia beef industry

The long-term outlook for the Australian beef industry is positive. Export demand is likely to strengthen and, as a consequence, cattle production is expected to increase over time. Continued dry conditions in southern Australia also favour a shift in the centre of gravity of the national cattle herd towards the north (Australian agribusiness group market overview 2007). (10), because southern producers are anticipating less rainfall and reduced irrigation allocations (1). This growth will be supported by continued investment in infrastructure such as fencing and watering points and improvements in management practice that will provide for ongoing productivity increases. Specific predictions for growth in the northern herd are not available. However in this report leading cattle producers are unanimous in stating that increased access to water would result in major expansion both in cattle numbers and in the production of finished cattle.

6.2 Challenges facing the northern Australia beef industry

A number of positive features of the industry's past will need to continue unabated to maintain this positive outlook. Declining terms of trade will need to be met by continued productivity growth and technological advances. Maintaining disease-free status is critical to the industry's well-being, for it provides considerable pricing and market access advantages. Likewise finding new and better ways to control cattle ticks offers parts of the industry scope to claim organic status and meat prices.

Addressing animal welfare and environmental concerns will become increasingly important as consumers become more discriminating and conscious of the whole of value-chain impacts of their purchasing choices. Indeed, growing consumer reaction throughout the western world against intensive 'factory farming' may well favour demand for northern range-fed beef.

The beef industry is one of the largest users of domestic transport infrastructure. Access to more sound roads, a reduction in rail and port bottlenecks and harmonisation of animal welfare and transport regulations across states boundaries would assist the industry to reduce costs (11). Similarly, improved access to mobile telephone and broadband internet services would provide the widely distributed and largely remotely-located northern beef industry with access to the skills and knowledge required adopt better practices faster, to underpin productivity growth and enhanced environmental stewardship (11).

Attracting and retaining labour presents an ongoing challenge to the northern beef industry, particularly during mining booms (9). Training, induction and supervision programmes that attract new industry participants are essential to arrest the decline in industry entrants, particularly against a background of declining regional population. The Red Meat Advisory Council has proposed an 'agricultural gap year' to encourage new, semi-skilled labour to the industry. Enhanced migration programs to provide access to overseas labour may also be advisable (RMAC). Some pastoralists see a need for schemes to encourage older Aboriginal men back into the cattle industry on a casual basis, to help mentor and recruit younger men to a livelihood in cattle production (11).

The potential for a Carbon Pollution Reduction Scheme (CPRS) poses a challenge for the beef industry in general and the northern industry in particular. The beef industry generates about 50% (or 45 Mt) of Australia's agricultural carbon dioxide equivalents (CO₂-e) (12), or 8% of total national CO₂-e emissions (13). Given that the beef industry comprises less than 0.5% of national GDP, it is a value-inefficient producer of CO₂-e; the nation derives more value per tonne from CO₂-e emissions in other sectors of the economy. This makes the beef industry politically and economically vulnerable to the introduction of a CPRS.

The beef industry in the north is particularly vulnerable for several reasons. It is a disproportionately large emitter of CO₂-e because stock fed on low quality native pastures produce more CO₂-e per kg liveweight gain than those fed on improved pastures. It is also a disproportionately large emitter of CO₂-e because, when pasture burning is taken into account, its 30% of the national herd is responsible for about 50% of the herd's CO₂-e emissions. (Although cattlemen note that not all the burning is as a result of their activities, but due to natural wildfires and others' land uses). It is also vulnerable because it is proposed that enterprises with >25 kt of CO₂-e emission will be required to hold emission permits from 2015. This will impact >50 enterprises in the north, with estimates of the financial impost on an average 15,000 head herd varying from *ca* \$500,000 (14) to *ca* \$850,000 pa (12) (assuming a permit cost of \$25/t CO₂-e). In the long term, this is likely to increase the costs of beef production by up to 20% and, as a consequence, to reduce national beef production by *ca* 8% (15). Paradoxically, while the cost increases imposed by a CPRS are likely to be greater in the northern than the southern beef herd, the contraction in herd size is likely to occur mainly in the south, where land is suitable for substitution of less carbon-intensive enterprises.

The cattle industry is also vulnerable because it is unable to claim offsets for carbon locked in its landscapes, which technically belongs to the Crown not the lease holder. This imposes a serious constraint on the ability and indeed the willingness of pastoralists to engage in landscape management leading to increased carbon sequestration. Furthermore most pastoral leases prohibit practices which could help remove carbon or offset emissions, such as revegetation and tree cropping and the production of biofuels for enterprise or wider use. Furthermore uncertainty of tenure imposes an addition risk. Many leases were designed over a century ago for conditions prevailing long before climate change became an issue, and should now be reviewed in the light of current science. The industry is thus trapped in a paradox in which carbon reduction measures may require it to do one thing, while pastoral lease and environmental laws require the opposite.

Present estimates suggest that a 15% reduction in animal-direct greenhouse gas emissions is the realistic limit of the technological options. Input and supply-chain management – in addition to macro-scale resource allocation decisions - will therefore provide the major avenues for greenhouse gas abatement by the northern beef industry.

Whether or not agriculture is included in the CPRS scheme from 2015, it will incur additional costs from 2011, related to higher input costs (e.g. prices placed on carbon emissions associated with inputs such as fuel and fertiliser) and processing costs (processors emitting >25kt of CO₂-e will need to purchase permits). In the short-medium term, this is likely to reduce farm cash income by *ca* 5% (15), which will further exacerbate producers' declining terms of trade and require them to extract greater productivity increases to remain viable. In the longer term, if producers are able to pass on increased costs to consumers, this may be offset by an increase in beef prices.

Industry participants fear that resource allocation distortions caused by government policy may harm the beef industry. The National Farmers' Federation (and many other agricultural industry bodies) is concerned that the impact of tax-free concessions to Managed Investment Scheme (MIS) operators, which in themselves distort land use decisions, will be exacerbated if MIS operators are allowed access to 'opt-in' provisions that would enable them to sell carbon credits under a CPRS (14). This could lead to forestry plantings at the expense of pastoral production. Should it occur, the perception of injustice would be increased by the fact that agricultural industries do not appear likely to be able to claim their carbon or nitrogen fixation as carbon credits. The Red Meat Advisory Council is concerned that subsidies for biofuels will lead to higher grain prices through enhanced and 'distorted' competition for feedstock. As about half of the north's beef production is destined for southern feedlots – that are based largely on internationally competitive grain prices – artificially high grain prices could severely and negatively impact the northern industry.

Many industry participants are critical of State-level legislative requirements that stifle innovation [e.g. (16)]. A common lament is the multiple and often conflicting layers of bureaucracy which must be dealt with in order to have even minor development plans approved. This is a frequent observation in all northern jurisdictions.

Uncertainty about land tenure is frequently cited as a major impediment to further development of the beef and allied industries. More rapidly assessing native title claims is seen by some as a solution to part of this issue. Also extending the term of pastoral leases or allowing more to be converted freehold are seen by some as important to securing northern development, especially where major investment in water infrastructure is required for cropping.

6.3 Opportunities for the northern Australia beef industry

The cattle industry is well established across northern Australia and, in the eyes of most of its members, represents a potential springboard for future development of food producing capacity of the North, both in meat and crops, provided a satisfactory balance can be struck between the needs of food production and those of conserving the essential Australian landscape, its qualities and ecosystem functions.

The first and clearest opportunity is to increase the value of its output by evolving from substantially a cattle industry into a beef industry, producing both finished animals and meat for domestic and international markets as well as store stock. This will depend on the wise and sustainable development of abundant water resources for improved pasture and fodder production, to finish cattle during the northern protein drought.

Development of irrigated pastures and fodder cropping will almost certainly lead to production of grain crops, horticulture crops and, potentially biofuels and other types of high value crops (e.g. bush

foods and medicinal plants), giving rise to a northern agriculture significantly different in character to that of the south and more suited to cope with its climatic extremes.

Since the cattle industry occupies so large an area (90% of the North) it offers unparalleled opportunity for carbon storage and offset through improved landscape management, tree planting, and biofuels production. If the question of ownership of the carbon can be clarified, it opens the north to potentially huge global investment by emitters seeking carbon credits, which could not only fund carbon storage and improved landscape management (Greening Australia, 2009) but also pay for the development of industry and national infrastructure, including water, roads, clean energy and other essential construction.

Finally, there are three important worldwide trends which favour development of Australia's northern pastoral lands in particular:

- Rising concern over global food insecurity, especially due to climate change (IFPRI 2009) and the possibility the north will be a 'climate winner'
- Increased consumer demand for clean, healthy and uncontaminated produce and emerging constraints on 'factory' meat production (Pew Commission Report, USA, 2008)
- The growing imperative to regenerate the world's grasslands and savannahs for carbon storage as well as food production and conservation (Savory et al.).

7. MOSAIC IRRIGATION

The Western Australian Government has identified intensification of beef production, based on irrigation mosaics, as a method for supporting a 'quiet revolution' in northern beef production. Much of that which follows is based on an excellent paper by Chilcott (17).

Demand for live exports to South East Asia has induced a change in northern beef production towards more rapid turnoff of young stock for placement in Asian feedlots. This market can absorb stock all year round, and if it were possible to capitalise on this, it would offer advantages for producer cash flow and efficient utilisation of on- and off-farm infrastructure. Unfortunately, the extensive nature of northern pastoralism, the lack of access to stock during the wet and rapidly declining pasture quality during the dry restrict the supply of suitable cattle to several months of each year (17).

Intensification of the beef enterprise, based on small-scale irrigated fodder production and fenced 'stand and graze' feeding systems would provide improved year-round access to stock and the ability to fatten them during the dry. In addition to providing improved supply for live export markets, a more evenly distributed supply of better condition cattle may make abattoirs possible in the north (Chilcott). (Previous meatworks closed many years ago because seasonality made it difficult to maintain a skilled labour force and to use capital efficiently.)

This quiet revolution in stock management can be achieved without resort to large scale, publicly funded irrigation schemes. In fact, it can probably harmonise best with existing beef enterprises and landscapes if it occurs on a small and distributed scale – mosaic agriculture. Using the mosaic approach, small scale irrigation infrastructure can be located where critical resources intersect and critical sensitivities are excluded. For example 30 ha irrigation 'circles' based on 300m centre pivot travelling irrigators can be located in areas with productive, resilient soils, access to water of suitable

quality and quantity and access to roads, power and labour – and avoid areas of significant environmental or cultural value (17).

With careful planning, the density and placement of irrigation ‘circles’ can seek the ‘sweet spot’ between occupying productive and accessible parts of the landscape, maintaining habitat connectivity for biodiversity management, and accessing groundwater from which extraction will minimise impact on surface water systems to minimise impacts on flow regime. The critical technical elements of achieving this ‘sweet spot’ are discussed in more detail in the *XXX, Agriculture* and *Terrestrial Ecology* sections of this report.

The low density of mosaic development, compared with larger scale irrigation schemes (that involve fixed assets and are usually publicly funded), enables them to minimise risks associated with the large water volumes and land areas associated with such schemes. These include reduced risk of significant groundwater draw-down (that harms sustainable extraction and landscape function), salinity, large scale habitat/function destruction, and their inherent lack of flexibility; being fixed assets, irrigation ‘schemes’ cannot be scaled or moved to meet market opportunities. Mosaics, because they rely on transportable infrastructure, can be scaled and moved in time and space to meet opportunistic needs, be they related to fodder or other crops. By this means, mosaic irrigation may assist the beef industry by providing diversification adjuncts to the core beef business, providing for more effective use of labour and associated capital and improved risk management.

Despite the many apparent advantages over large scale irrigation schemes, direct evidence of the benefits of mosaic irrigation is limited by the small number of existing examples. Given their relatively small scale, there exists a low-risk opportunity to establish and monitor a number of mosaic irrigation sites across northern Australia, with a view to better understanding their impact on and by the landscape.

8. DEVELOPMENT OF INDIGENOUS PASTORAL ENTERPRISES

Indigenous communities have proprietary rights over significant tracts of land in northern Australia, through a variety of freehold, leasehold and reserve arrangements (18). Much of this land falls within the pastoral zone and is not currently managed for optimal beef production. Consequently, there exists an untapped potential to increase livestock numbers in the north. Chilcott (17), for example, estimates that with appropriate support it may be possible to double cattle numbers in the Kimberley by intensifying management of Indigenous land.

Many sources see Indigenous pastoralism as a means for combining connection with country and economic opportunity. The Indigenous Land Corporation (ILC), established as a statutory authority in 2005, aims to “assist Indigenous people to acquire and manage land to achieve economic, environmental, social and cultural benefits” (19). A major plank of its strategy is the purchase and management of pastoral properties, through which it aims to assist Indigenous landholders to bring Indigenous-held land back into production and to provide industry-based training to enable employment in mainstream businesses, often using residential-based training facilities.

At present, the ILC has 8 pastoral properties in the bailiwick of this report. Two of those (Roebuck Plains and Myroodah stations) are fully operational. The remaining six (Home Valley, East Esey, Waliburru, Merepah, Bulimba and Crocodile-Welcome stations) have been acquired only recently

and are under development. The trajectories of Roebuck Plains and Myroodah will illustrate the development trajectories aspired to and possible for Indigenous pastoral enterprises.

Myroodah is a *ca* 400,000 station running *ca* 20,000 head of cattle. It was purchased as a run-down property in 1999 and, in the intervening 10 years, the ILC has developed about 50% of the property. Following major capital works that installed watering points, fences and laneways it was possible, in a single year, to increase stock numbers by 30%. Similar works continue, with accommodation, sheds, bores and roads being built to support further growth. In 2008, the station employed nine Indigenous people and hired a number of Indigenous contractors for fencing and other work. On-the-job-training provided development opportunities that will provide the basis for future work (20).

Roebuck Plains is a 283,000 ha station running *ca* 20,000 head of cattle. In addition to being a successful commercial beef enterprise employing nine Indigenous people, Roebuck Plains hosts a TAFE facility that trains Indigenous people in certificate level Rural Operations and Agriculture courses. Its residential capability provides it with distinct advantages in training young Indigenous men (20).

The existing employment opportunities afforded by the ILC cattle properties are not large (if there were nine Indigenous employees on each station, it would provide jobs for *ca* 70 people). Direct and current employment figures, however, undersell the value of Indigenous beef enterprises, which derive considerable value from their capacity building and connection with country functions. Their continued commercial growth is likely to make a significant contribution to the intensification of the beef industry.

9. CORPORATE AGRICULTURE AS A FACILITATOR OF DEVELOPMENT

Australia's ambivalent attitude to corporate agriculture, oscillating between government intervention and *laissez faire*, has, in several industries, led to precipitous decline or major change in service provision that has retarded investment. Industry players identify inadequate investment in infrastructure (roads, wharves, ports, abattoirs, communications, etc) as a serious impediment to growth of the northern beef industry (9) (11). This leads some to call for increased government expenditure, while others contend that opening access to water for industry expansion will trigger increased private investment in infrastructure.

Don Mackay (21), former CEO of the Australian Agricultural Company, argues that strong corporate agricultural enterprises comprise part of the solution. Their access to 'informed' and 'patient' capital can help them to deal with many of the problems that befall family-owned or tax-centred enterprises.

- The higher risks associated with agricultural production in the north can be 'averaged' and managed through access to the greater mass of capital provided by corporate structures
- Highly skilled staff, deployed at corporate scale, are required to drive development in production and marketing
- Corporates are capable of scoping infrastructure developments and may be able to achieve the mass required to attract government co-investment infrastructure
- Corporates that are involved in farming plants and animals, rather than tax benefits, have an incentive to invest in the above because it underpins productivity and profitability

His vision for northern Australia in 2020 is:

- Northern Australia will dominate beef production, based on production improvements that include efficient irrigation and access to improved plant varieties.
- Rural populations will grow in response to increased long-term employment opportunities, of which Indigenous people will have a major share.
- Well-researched and -planned development will have minimal impact on the environment and,
- Enabled by the improved infrastructure and services provided for primary industry, the tourism industry will flourish.

The beef industry's status as a major part of the economy, culture and landscape of northern Australia make it clear that its future and that of the north are inextricably linked.

9.1 What industry leaders say:

1. Rohan Sullivan, Cave Creek Station, president NTCA

Rohan's family runs 5000 head of cattle on 37,000 ha Cave Creek Station, near Mataranka, NT. The property in the famous 'Never Never' was purchased in 1990. It has 2700 breeders and focuses production mainly on the live cattle export trade with Indonesia. The property consists of undulating savannah-woodland country with red sands dominating a mix of soil types including black-soil creek frontages. The main grazing pastures are reached via creek crossings that routinely flood in the wet season, cutting access for months at a time. Local Underground water resources are at their highest level ever recorded, offering considerable development scope. Rohan's long-term aim is to double the number of breeders, in line with expanding beef demand in Asia and diversify into some cropping.

He envisions the typical future northern cattle enterprise might include:

- A major enterprise breeding cattle for live export or southern feedlots
- More improved pasture and fodder production, using local water resources, finishing cattle where feasible
- Increased mobility between properties to take advantage of seasonal pasture flushes.
- Tree planting for timber, carbon sequestration and biofuels production
- Small enterprises in aquaculture and horticulture where resources are sufficient
- Outback tourism and related cultural and environmental enterprises.

The northern component of the northern beef herd will focus on the live cattle trade to Asia, which is expected to continue to expand as a result of economic growth in countries such as Indonesia and Vietnam and, to a lesser degree, China, Rohan predicts. The central and southern components of the northern industry will move between this, the US export market and the southern feedlot market, as opportunity dictates.

Scope to finish cattle in the far north of Australia is severely limited by the 'protein drought' which can last for up to ten months of the year. The strong wet/dry rainfall pattern, low inherent fertility of the soils, poor pasture quality and high evaporation rates from water storages increase the difficulty of raising cattle for other markets. However, in some areas

there are plentiful underground water resources which have not yet been tapped to any great extent and which show signs of being further recharged as the climate becomes wetter. These offer significant potential for the production of fodder, grain and even horticultural crops, to strengthen and diversify the core cattle enterprise. "At the moment we have six months of excessive rain, and six months when we were short of water. We sometimes get incredible amounts of rain – 50 inches in two months last year, and most of it ran away," he says

Rohan believes that there should be extensive investigation and quantification of northern groundwater resources, assessment of their rates of recharge and an examination of efficient ways to store water in the dry season, including managed aquifer recharge, to underpin future development of both grazing and farming in the Top End. Coupled with emerging technologies such as the operation of remote bores, pumps and tanks via telemetry, new methods of preventing leakage and evaporative losses (as high as 2m a year in the region), he sees a need for a major focus on water resources to underpin future development and diversification of the grazing and mixed farming sector.

The advent of carbon trading and/or taxes is widely seen as a negative for the viability of the northern cattle industry: "The problem is that we are seen as big emitters because of all the methane produced by cattle, but no offsets are offered for all the carbon we lock up in pastoral landscapes," he says. "We could be close to carbon neutral but you wouldn't know it." Anecdotal evidence from cattle producers suggests there has been a "thickening up" of the country in recent years, a relative increase in the amount of trees and woody plants in the landscape. This may be due to increased rainfall, changing management practices, CO₂ fertilisation - or all three. However it does suggest increased scope to store more carbon in northern landscapes, either by natural change, deliberate management or actual tree planting (in areas with suitable rainfall and soils) for paid carbon sequestration. Rohan believes the scope for increasing carbon storage in semi-arid and wet-dry tropical regions in conjunction with grazing needs much more serious investigation as, both from an Australian and a world perspective, these are vast areas occupying a significant proportion of the Earth's land surface, and hence with considerable potential as a carbon sink. If carbon storage emerges as a viable source of income to extensive grazing, it may offset any negative impact of carbon trading/taxing and even generate new enterprises (eg trees for sequestration, timber, biochar and biofuels production).

At the same time he sees a need for stepped-up research into reducing methane emissions from cattle grazing poor quality northern pastures, by feed supplementation (with protein produced from irrigated crops and improved pastures, or special additives) and rumen manipulation.

In a world where health-conscious consumers pay premium prices for 'organic' and low-input produce, pastoral cattle have a strong 'clean, green' appeal. Rohan believes there should be a research focus on minimising chemical inputs to the northern cattle sector so it can trade on this image. This includes better parasite control methods, improved vaccines etc.

Grazing a part of Australia where soils and pastures are often poor and low in nutrients, Rohan is acutely aware of the risks of growing world nutrient shortages and the scope for fertiliser prices to skyrocket along with oil and gas as the world passes Peak Oil. He considers there should be a national focus on ways to reclaim nutrients from the waste streams of large cities such as Brisbane, Darwin etc for re-use in agriculture or on improved pastures.

In the longer term Peak Oil also spells trouble for the highly transport-reliant pastoral industry. For this reason Rohan considers it may be necessary for individual enterprises to develop their own alternative fuel sources, whether these are crop biofuels, second generation biofuels, solar electric or solar thermal/hydrogen sources. Northern development plans need to encompass likely changes in the global energy mix and encourage the development of alternatives.

In terms of infrastructure, the most urgent outstanding need of the northern cattle industry is for better roads and low-cost bridges across key rivers and creeks so that stock can be moved out during the wet. This will become more critical in the next 8-10 years as the timing of Ramadan moves back by approximately 2 weeks/year and will coincide with the wet season by about 2017. This is a peak time for beef consumption in Indonesia and a peak time for cattle imports is in the 2-3 months leading up to Ramadan. Rohan considers the current focus on building roads first and bridges second to be misguided; also, that present bridge design is over-engineered and far too costly. These factors are holding back the industry in certain areas and the economic development of many large remote aboriginal communities. The development of a low-cost, single lane, low-height bridge design for use on key rivers in the north would be a big help. He also notes the need to upgrade port facilities in Darwin to allow for growth in live cattle shipment.

The future of Australian pastoralism will depend increasingly on being able to move stock promptly into areas with good feed, and out of areas which are becoming affected by seasonal conditions. The picture is of a far more mobile industry in the future. To achieve this, the industry needs major advances in two scientific areas:

- Improvements in remote monitoring of pastures delivering useable information at least weekly basis, if not in real time, in a form useful for grazing management
- Improved seasonal forecasting reliability, based on the latest climate modelling (including better prediction of wet and dry seasons, duration, breaks and monsoon activity).

He says another factor important to the future of the northern cattle industry is biosecurity, given potential threats to the disease free status of the NT and Australia in general. He emphasises the need to maintain surveillance and monitoring programs and response capability within Government Agencies including state departments.

Finally, Rohan is of a view that the full potential of the northern cattle industry will not be realised without much greater engagement of Aboriginal people, both older and young. He recognises the importance of Aboriginal-owned stations, but also believes that there must be more effort to achieve economic participation of people living in remote communities and town camps. He considers that older Aboriginal people, who have some experience of cattle work, can possibly be attracted to part-time or casual work in cattle enterprises – fitting in with their cultural obligations – and that they can then play a vital role in motivating young people to take up work in the industry and build livelihoods in it.

Summary of needs:

- Assessment of northern water resources and technologies to develop them sustainably
- Assessment of scope for carbon sequestration in northern grazing landscapes, including new income to offset carbon trading
- Research into pasture improvement, feed production, grain production and alternative cropping enterprises
- Further research into ways to reduce methane emissions from northern cattle
- Research into 'clean green' cattle technologies and methods
- Research into alternative transport fuels for pastoral enterprises

- More bridges, better roads and port facilities to allow for industry expansion
- Advanced remote sensing methods for pasture and stock management
- More accurate seasonal forecasting
- Strategies to re-engage Aboriginal people in the cattle industry.
- More accurate seasonal forecasting
- Strategies to re-engage Aboriginal people in the cattle industry.

2. John Cotter, president, Agforce Queensland

The issue at the heart of northern development, for cattle or for agriculture is water, says Agforce Queensland president John Cotter. “We need to make a philosophical decision whether or not Australia is to remain a major food producing nation. At the moment we take our food for granted and the average person does not understand what it takes to produce it. We can have pristine rivers – or increased food.”

He considers there to be great potential for harvesting water sustainably from the north during the wet and moving it progressively further south, by pipeline (to avoid evaporative losses) onto good soils to grow fodder to finish cattle or for intensive farming and horticulture aimed at the Asian market. Key to this, he says, is learning from the mistakes made in the Murray-Darling Basin. He would like to see large scale water modelling to identify with greater clarity the opportunities that exist, pointing to the Emerald-Fairbairn scheme as an example of the sort of development envisaged.ⁱ This scheme has underpinned a dramatic diversification in the range of goods and services produced in the Emerald region, exceptionally low regional unemployment, strong enterprise development, a major retail centre and a much wider range of government services that are commonly found in rural areas. John Cotter sees similar prospects arising from northern water resources.

“There is a need for Australia today to be more visionary. We live in a time when a billion people are hungry, and billions more are gaining the incomes to afford more and better food. The Ord Scheme, for all the controversy surrounding it, has shown the way and we need to be sure that Australia can keep pace with the rising demand for quality food.”

Mr Cotter says a major impediment to expansion of the northern cattle herd is the lack of processing facilities in the Top End, pointing out that the circuitous route which cattle and beef must now travel – south before heading north again – adds to costs, emissions and inefficiency. “A regular, reliable water supply will end the seasonality of livestock production in the north, enabling beef to be produced year-round. This in turn will create the incentive for private investment in meatworks and other facilities, although if we were really serious, we would foster this with tax incentives.” Australians have just received a huge stimulus to help the economy avoid recession, and there is equal logic in creating incentives to underpin the development of northern Australia’s agricultural potential, particularly at a time of

growing global food scarcity, he says. “As Asia grows, agriculture is the industry of the future.”

He is chiefly concerned that outdated perceptions of agriculture as a ‘sunset industry’ held by many urban Australians, including politicians, are holding back development of the public infrastructure that would enable agricultural expansion to occur in the North. The minerals sector receives what is necessary to its expansion, yet agriculture continues to suffer comparative neglect and low priority.

A second major inhibition to northern agricultural growth is R&D, he says. “Agricultural research in Australia has shrunk appallingly in the last 30 years, and is now at its lowest ebb at a time of greatest global need for it. This is partly due to declining public investment but rural industry also needs to show more leadership in this regard. We have built our modern farming system on R&D – such as the tremendous improvements in soil moisture conservation which have taken place in recent decades.” The danger is that the agricultural research machine has been allowed to run down just at the time when Australia needs to expand food production, both for its own strongly growing population – forecast to reach 35 million in 2050 – and to overcome the inevitable challenges that will be encountered as new farming systems are developed for the different soils and climate of the North. “The truly futuristic research is not being done and farming as a whole is running into a major technology pothole,” he warns. “There is no shortage of good R&D for energy – but for food, the investment is a fraction of what is needed. We must understand that global food demand is set to double – and we need to invest now, as it can take 10, 20 years or more for new science to be widely adopted on farm.”

As food production in Asia, China especially, comes under increasing pressure from climate change, Australia may find itself increasingly exposed to the ‘land-grab’ that is now going on globally with many nations buying up farm land and water in other countries for their own needs, if we do not make sufficient effort to develop our own resources, he warns.ⁱⁱ

At the same time a world shortage of fossil fuels is emerging as demand outruns the discovery of new oil resources. Countries such as the US, Brazil and Denmark are investing in biofuels – mainly ethanol or biodiesel – in anticipation. Although Australia has abundant alternative energy sources, investment has lagged far behind. Mr Cotter considers the North to offer considerable scope for energy development including solar, geothermal, clean coal, as well as biofuels and hydrogen energy, based on its very large land and water resources. These require strategic planning and investment.

A looming world shortage of nutrients, especially rock phosphate and possible nitrogenous fertilisers (made most cheaply using natural gas) points to the need for Australia both to protect and to develop its domestic resources of these vital agricultural inputs, he says. Consideration should be given to reserving some of our abundant natural gas for domestic needs to avoid future shortages of low cost fertiliser.

Similarly, with food scarcity emerging as an issue, Australia needs to think far more strategically about how it uses its land. At present large expanses of the continent’s most

productive land have, and are, being taken out of agriculture for urban development, recreation, coal mining and other non-food uses. Mr Cotter considers the need is now urgent for Australians to be better informed about their food supply and the need to protect and develop its resource base, so that public opinion will encourage better policy decisions to stem the loss of prime farming land or facilitate development of agriculture in the north. He instances the 'draconian' regulations that govern water access and land use in the North as typical of these impediments.

He considers that a major role for government, as a facilitator of development, would be to commission a major in-depth assessment of food security and food demand in Asia over the coming 30 years, to provide the context for a renewed phase of agricultural and northern development in Australia.

Summary of needs for northern agricultural development:

- A major plan to develop northern water resources on a managed, sustainable basis
- Such a plan would be a signal to investors to develop the necessary infrastructure for increased cattle production and farming in the north
- Major re-investment in Australian agricultural R&D with a particular focus on overcoming the challenges inevitably to be faced in opening up the North: learning from the experiences of the Ord and the south
- A plan for the development of northern energy resources to underpin future development and new industries
- Strategic set-aside and development of Australian nutrient resources, to ensure agricultural productivity can be sustained in a time of growing global scarcity
- A national focus on the need to protect prime farm land from further encroachment by non-food activities and to develop new areas in the north
- A major investigation of food demand in Asia and related food security issues liable to affect Australian security into the future.

3. Don McDonald, McDonald Pastoral Co

McDonald Pastoral Co operates 11 cattle stations and a feedlot in Queensland. These extend over 2 million hectares, ranging from the Gulf Country and Channel Country to the southeast. The enterprise runs 170,000 cattle, primarily for feedlot production targeted at the domestic, Japanese and Korean beef markets, with some live cattle exports to Indonesia and The Philippines

Don McDonald considers there is scope to more than double output from his operations, and indeed the northern cattle industry generally, but warns this cannot occur without substantial investment in infrastructure, water resources and research and development. "If,

through the development of water resources, we can improve northern pastures to overcome the seasonal protein drought, graze more intensively and raise weaners better we could lift productivity by two, three, even as much as four-fold," he says. "But then you also have to be able to get them to market, year-round. At the moment many properties are cut off four and even five months of the year."

He sees exceptional potential to develop northern water resources by constructing a series of low weirs across the Mitchell River and other northern rivers such as the Gilbert, Archer, Flinders and Staten. These would have the effect of retarding peak flows during the wet, allowing more water to sink into the sandy gravels of the river bed and immediate floodplain, where it can be stored underground without risk of evaporation until needed to irrigate fodder crops and improved pastures. The storage capacity of this aquifer recharge scheme is 'quite extraordinary', he says. The present extreme seasonality of good feed in the Gulf region makes the raising of high-quality young cattle very difficult, and necessitates regular destocking. The availability of a reliable year-round water supply would revolutionise cattle raising over very large areas of northern Australia, extending enterprise options from breeding to finished cattle. Don considers that this approach, especially if combined with a dam on the Mitchell headwaters to further even-out flows, would have a profound effect on the food growing potential of the Gulf region, both cattle and crop, including horticulture. He recognises that current 'wild rivers' and water management policies make this proposal controversial but argues that with emerging world food scarcity, Australia can ill afford to neglect any of its farming potential, especially in the north where rainfall is expected to increase. The lessons hard-learned in the Murray-Darling Basin and other catchments provide a strong basis of understanding for the sustainable development of northern rivers to achieve a balance between both food production and environmental objectives, he says. He would like to see these possibilities receive rational and objective study.

The Gulf region also has considerable artesian resources, but their extent, quality and rate of recharge has not been fully determined. However they too represent considerable opportunities for production of fodder, grains crops (such as maize) and even horticultural crops destined for the Asian market. Don would like to see them included in a full assessment of northern water resources.

Doubling food production in the North is pointless without the means to move it to markets year-round, Don emphasises. The greatest obstacle to doubling the food output of the North and its most urgent need is for good all-weather roads and bridges and strategically-located rail facilities. While rail has suffered comparative neglect in Australia in recent decades, Don considers that Peak Oil is likely to have a profound impact on global transport systems, playing in favour of renewed rail development. The North is amply endowed with energy resources for generating electricity, including (clean) coal, solar, wind and geothermal and these could in future power electrified rail as the backbone of a future transport system.

The northern cattle industry is perfectly positioned to meet rising global demand for clean, high-value, organically-grown beef but for one impediment: the cattle tick. This continues to necessitate chemical treatment. “But for the tick, we would be chemical free,” he says. While there has been much research into ways of controlling ticks in the past, Don believes that a major new research program should nevertheless be instigated to investigate biological methods of tick control. “Cattle in this region are mainly *Bos indicus* blood because of their tick resistance, and while they are fine cattle, we do need more *Bos taurus* genes in the herd to produce the high quality, tender beef now demanded by the market. An effective, clean means of controlling ticks would be one of the greatest services that could ever help the development of the northern herd.”

One of the gravest threats to the future of the industry, especially at current levels of profitability, is the potential for high costs associated with carbon trading or taxes aimed at controlling methane emissions from cattle. Grazing poor quality pasture for part of the year, the northern herd is particularly susceptible. In the first instance Don would like to see the carbon storage potential of northern landscapes more accurately appraised, as a valid offset to cattle emissions. In particular he wishes to see the carbon cycle between cattle emissions and pasture regrowth properly assessed. In some environments receiving more regular rainfall, carbon storage may be enhanced through tree planting and biofuels production. “We need a thorough investigation of the best ways of capturing carbon in the northern rangelands,” he says. Beyond this he would like to see increased research into feed supplements, genetic methods and rumen microbiology as a way of checking emissions and turning methane into meat. “I understand certain sheep strains have been found which are naturally low methane emitters, and it may be that similar genes exist in cattle which we could breed into the northern herd. However the simplest and most practical approach is through feed supplements which enable more of the feed to be digested.”

Don recognises that both feed supplements and the development of improved pastures and fodder crops to double the northern cattle industry will demand large inputs of fertiliser – at a time when world supplies may well be running low or becoming prohibitively expensive, towards the middle of the century. “You can’t just double global food production without a great deal of fertiliser,” he points out. He considers it will be important for Australia to adopt a strategic approach to managing its nutrients which includes developing and husbanding its phosphate rock and natural gas (for N fertiliser production) reserves. This would include exploring the potential to recycle nutrients from urban waste streams back into agriculture.

Summary of needs for northern cattle development:

- Detailed evaluation of water harvesting and storage potential of the northern rivers, on a sustainable basis
- Assessment of northern groundwater resources and recharge rates

- A major emphasis on road construction and the development of electrified rail lines to provide transport for the expanding northern food industries year round, based on renewable or clean energy
- A crash research program to come up with a biological solution to the northern cattle tick, to meet rising consumer demand for 'organic' beef
- Evaluation of the carbon storage potential of the northern rangelands, both for income and for carbon offsets to cattle emissions
- A major new research program into ways to turn methane into meat
- A strategic approach to Australian nutrient resources, including their development for domestic use and the recycling of urban nutrients.

4. Brendan Menegazzo and Tony McCormack, Stanbroke Pastoral Co.

Stanbroke runs 200,000 head of cattle on 4 million acres in the Gulf Country; it has a feedlot at Chinchilla on the Darling Downs and a state-of-the-art abattoir in the Lockyer Valley, near Gatton. It markets its beef under the Diamantina and Circle 8 brands. The company is wholly owned by the Menegazzo family, irrigators originally from the NSW/Victoria border region who bought it from AMP in 2004. It is believed to be the largest privately-owned, vertically-integrated beef enterprise in the world, employing over 500 staff.

Since purchasing Stanbroke, the family has concentrated on its holdings in the northern Gulf region, because of its reliable rainfall and, indeed, the prospects of increased rainfall under climate change. They see exceptional scope both to increase cattle production including finishing cattle for the export market, as well as diversifying into cropping and high-value horticulture, while leaving 'more than sufficient' for the environment.

They point to the cattle finishing enterprise at Lorraine Station near Burketown, as an example of what can be achieved. Uniquely in the north, Lorraine has its own feedlot, feeding up to 7500 cattle and irrigating 900 ha of fodder crops. Weaners are given a 'head start' in the feedlot then put out to fresh grass when the wet comes.

The development of cattle finishing in the north would in turn unleash the necessary investment in roads, rail, meatworks, port facilities and other infrastructure necessary for expansion in the industry, the Stanbroke principals. Access to water would also encourage the development of grain production and horticultural industries, taking advantage of experience accumulated by others on the Ord River over recent decades.

However, they say, "Queensland Government policies regarding water, land and vegetation management have and will significantly, adversely impact development in the Gulf Region through the following:

10. WATER SECURITY

“There has been no issue of, or dealing with water licensing in the Gulf Water Resource Area for more than six years. The Gulf Water Resource Plan (WRP) is a huge area (315,000 km²) including 8 major river catchment systems and all Stanbroke’s Gulf properties. The planning commenced on 6 June 2003 with a Moratorium on the application and issue of new water licenses to maintain the status quo during planning. The Draft WRP was released in October 2006 and the Final Gulf WRP was issued on 1 November 2007. The draft announced an intention to allocate 1.88% of the annual discharge for all uses. Stanbroke’s Draft WRP submission stated our concerns for the conservatively inaccurate measurement of water volumes and the unscientific and unnecessarily conservative allocation of water for irrigation purposes. In its submission, Stanbroke identified 575,000 hectares across its properties suitable for development. The plan potentially allocates a total of 302,728ML for all purposes compared to Stanbroke’s submission advising its needs in the area totalled 1,595,000ML. No changes were made to the draft. Several major catchments have little or zero water to be allocated for irrigation in the life of the Water Plan, 10 years. The Gulf Water Plan permits the possibility of 1.88% of the total annual discharge to be used for all purposes.

“In the Gulf region the wet generally lasts between two and four months and the water just rushes straight into the ocean,” Tony comments.

“The second phase of the Gulf Water Planning process, the drafting of the Gulf Water Resource Operations Plan (ROP), was announced on 3 November 2006 and the 6 June 2003 Moratorium was extended. The Draft ROP was released on 24 October 2008. Stanbroke’s Draft ROP submission on 30 January 2007 that much of Stanbroke’s land is downstream from the traditional and anticipated irrigation hot spots, such as the upper reaches of the Flinders and quite apart from the issue of equity, much of the catchment’s water originates downstream from these hot spots and that Stanbroke has the land, managerial experience and expertise and the financial resources to use the water efficiently, effectively and profitably and urged the government to expedite the process. The final ROP approval is still to be completed and therefore the 6 June Moratorium remains in place.

“The Wild Rivers Act, 2005 was introduced to control development in designated catchments. Nine catchments have since been declared under the Act. Stanbroke had two properties directly affected by first round of Wild Rivers Declarations and areas on the remainder of the Gulf properties remain eligible for future declaration. Stanbroke was closely involved along with many other pastoralists in making the application of the legislation workable but were unable to effect any meaningful change to the overall restrictions put in place. Stanbroke’s Wild Rivers submission highlighted the unnecessarily conservative proposed high preservation area distances which would result from the legislation and could adversely affect the future development potential of Stanbroke’s Gulf properties.”

Similar uncertainties apply to groundwater.

10.1 Evaporation

Because there is a short timeframe to harvest the water for use through the year, evaporation is a major issue for long term water efficiency that will only be resolved by innovative solutions such as:

- replenishing natural underground storage aquifers (as the Burdekin sugar cane growers do);
- developing cost effective; covered, lined man-made storages, or
- using best-practice harvesting and storage developed for the renewal of the Murray-Darling Basin etc.

11. LAND SECURITY

Stanbroke says the second major factor holding back development is land tenure. Pastoral leases are subject to review and then may be renewed for 30-40 years, or in cases where there is an agreement with Aboriginal owners, up to 50 years. Companies are not entitled to hold a perpetual lease or to convert leasehold land to freehold, a situation the National Competition Council has deemed anti-competitive. This lack of water, secure title and the restriction which the lease places on other activities such as cropping constitute a major barrier to investment and further development.

12. VEGETATION MANAGEMENT

Stanbroke notes that Broad scale native vegetation clearing (under the Vegetation Management Act) ended in Queensland, on 31 December 2006, following a two year “phase out period”.

“The Vegetation Management (Regrowth Clearing Moratorium) Act 2009 took effect from 8 April 2009. Under the moratorium, all native regrowth vegetation within 50 metres of a watercourse in the priority reef catchments regions and endangered regrowth vegetation in rural areas across the State on freehold and agricultural and grazing State leasehold land are covered. The Moratorium was brought in while the Government develops permanent regrowth protection measures. It currently expires on 7 October 2009.

“The 50 meters protection from a watercourse is interesting as all Queensland Government environmental legislation intending to protect the environment from harmful activities has a maximum protection zone of not more than 200 meters, except for Wild Rivers which is 1,000 meters.”

13. OWNERSHIP OF TIMBER ON LEASEHOLD LAND

“Timber on Queensland leasehold property (about 65% of Queensland land area) is owned by the state. This potentially complicates the operation a Carbon Trading Scheme generally with the inability to plant trees for carbon storage and particularly as it denies the possibility of offsets if Agriculture is included from 2015.”

Were these water, land tenure and land management issues to be resolved Stanbroke says, its principals see “no limits to the potential of the North for cattle and agricultural development.” There

is plenty of land, more than sufficient water and the region is conveniently close to Asian markets. “We could easily double our meat output just by growing fodder crops (such as leucaena) under irrigation to finish cattle for direct export in the live trade, instead of shipping them south. It would be much more efficient,” Tony McCormick says.

14. RESEARCH AND DEVELOPMENT

Stanbroke sees a need for a continued strong R&D investment with a particular focus on ways to reduce the carbon footprint in the cattle industry, the development of alternative forms of energy for the time when peak oil and climate change make fossil fuels scarce or too costly, and improved livestock management technology for activities such as speying, tick control, castration and dehorning. Also, an improved understanding is needed of the geological sequence and hydro geological processes beneath the Gulf region.

15. SUMMARY OF NEEDS OF NORTHERN CATTLE INDUSTRY:

- Security of access to both surface and underground water resources, enabling a doubling in cattle productivity and the development of new cropping industries (fodder, grain, horticulture, biofuels)
- Ability to harvest and store surface runoff sustainably, using best practice methods and with full regard to the lessons learned in the MDB. Including an improved understanding of the geological sequence and hydro geological processes beneath the Gulf region.
- More flexible perpetual leasehold and/or freehold property rights and conditions allowing cropping for feedlotting, fodder, grain, horticulture and energy crops.
- Increased research focus on ways to reduce and/or offset greenhouse emissions from cattle production;
- Increased R&D in support of northern cattle production.

5. Rob Gillam, president WA Pastoralists and Graziers Association

Rob Gillam says that the Kimberley cattle industry generally sees opportunity for expansion and for the production of quality beef based on the development of irrigated pastures for dry-season feed and the adoption of improved genetics in the herd. “At present there is only a short window for producing quality beef but this can be expanded, and there is certainly scope to double the value if not the numbers.” The rate of expansion will depend on the opening up of new markets in China and Asia, as present demand is primarily focussed on store stock for the live export trade.

He says there needs to be in-depth assessment of Kimberley water resources, surface and groundwater, and rates of recharge of the latter. The main obstacles to developing these at present are the terms imposed by current pastoral leases, further complicated by native Title issues.

Horticulture is 'here to stay' in the Kimberley following successful development in recent decades on the Ord and around Broome. In this respect the Fitzroy river basin offers enormous potential for future development but Mr Gillam recognises this is unlikely to occur until the Ord is seen to be '100% viable'. The 'white elephant' image of the Ord irrigation scheme has long been put to rest in WA, he says, though it may still linger in Canberra and this attitude may pose an inhibition to further development.

The Pilbara region offers some scope for expansion in the cattle herd, based on accurate assessment and development of its considerable groundwater resources and possibly, some harvesting of the region's highly episodic flood events. The Gascoyne likewise is seen to have potential for expansion based on water and improved genetics. In both cases the primary emphasis will be on production of store cattle as opportunities to finish stock are few in the region.

A major obstacle to future development of the livestock sector is the growing wild dog problem, he says. This has virtually eliminated any possibility of grazing sheep or goats and is making cattle production increasingly difficult. Owing to the reluctance of older dogs to take a bait and the lack of alternative control methods, Mr Gillam sees a bounty as the best answer to this to encourage more trapping, which would provide employment for Aboriginal people at the same time.

He notes growing concern about possible future shortages of transport fuels and fertiliser and says that a proposal has been floated to build a fertiliser plant at Burrup to exploit NW Shelf Gas. However such ventures will probably depend on the rate of development of the northern cattle industry overall and its demand for fertiliser for improved pastures and fodder crops.

Mr Gillam also expresses concern about the likely impact of a carbon reduction scheme on pastoral incomes and says there is a clear need for more research into the carbon cycle in the various northern cattle industries with their widely differing climates and conditions. In particular he wishes to see the potential explored for pastoralists to earn carbon credits and income from carbon storage.

16. CONCLUSIONS

At a time of increasing pressure on land and water resources in Australia and worldwide and amid emerging stresses on world food security under a changing climate, Northern Australia is emerging as a place with potential for strong growth in primary production. Indeed, as is clear from the foregoing, its leading members consider there is scope to increase the value of northern primary production several-fold, both from cattle and cropping on a sustainable footing. That, in their eyes, such development is both practical and achievable with the right support and policy settings. This report outlines a number of changes, advances and developments seen as necessary for this to occur.

However there also exist a number of significant constraints, both regulatory and physical, which revolve around the issue of whether or not Australia wishes to develop the north or to retain it in a relatively undeveloped state for reasons of landscape and ecosystem conservation. Striking the right balance between these two aspirations may soon become an unavoidable issue in a world of growing food insecurity: it goes beyond the immediate questions of environment versus development to issues of national security, self-determination and Australia's role and responsibilities in an increasingly hungry, unstable and resource-limited world.

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ⁱ For a description of this see <http://www.aph.gov.au/house/committee/primind/rdinq/sub257e2.pdf>

ⁱⁱ See <http://farmlandgrab.org/>