



Irrigated agriculture and the northern Australian beef industry – what are the opportunities?

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1. Overview of irrigation in northern Australia

The north ... untapped potential

A long held policy ambition and has through history attracted entrepreneurs

Renewed enthusiasm from communities and government to 'develop the north'

A key part of Australia's response to a growing Asian economy, global food security, nation building

Perceived untapped soil and water opportunities for agricultural development



The tropical north's agricultural resource base



- 20% of Australia's land mass
- 26% (1m GL) of Australia's water
- 17 m ha potentially irrigable
- 30% (9 m hd) of Australia's beef herd
- 2.5% of Australia's irrigated area

Is irrigated agriculture northern Australia's Cinderella industry?

Or will it remain an elusive “pot of gold”

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Ord experiment a 'failure'

19 Aug, 2013 08:00 AM A+ A-

FLEUR ANDERSON

THE former chairman of Kevin Rudd's hand-picked taskforce to develop northern Australia said the Ord Irrigation Scheme has failed to become the region's food bowl.

Joe Ross, a prominent indigenous leader appointed by Mr Rudd in 2008 to oversee a wide-ranging study into the future of economic development in the north, said the Ord River Irrigation scheme had become one of the world's largest sandalwood producers.

But the region has a history of failed food production, says...

Learning from history - matching expectations with realities



“Those in charge of the cotton work here, of course, are so enthusiastic that they have already persuaded me (a) that it is the best cotton in the world (b) that in due course, and with occasional interruptions it will be practically immune from pests (c) that it will command the world’s price and ...” (R.G. Menzies, Opening of the Ord River Diversion Dam, July 20, 1963).

By 1974, the cotton crop received 30 applications of DDT/organophosphate and with these high costs and reduction in cotton subsidies it was no longer viable

Learning from history - matching expectations with realities



Qld British Food Corporation
Central Qld 1949



Grain storage facility
Archer Point, 1975

Learning from history – understanding what works



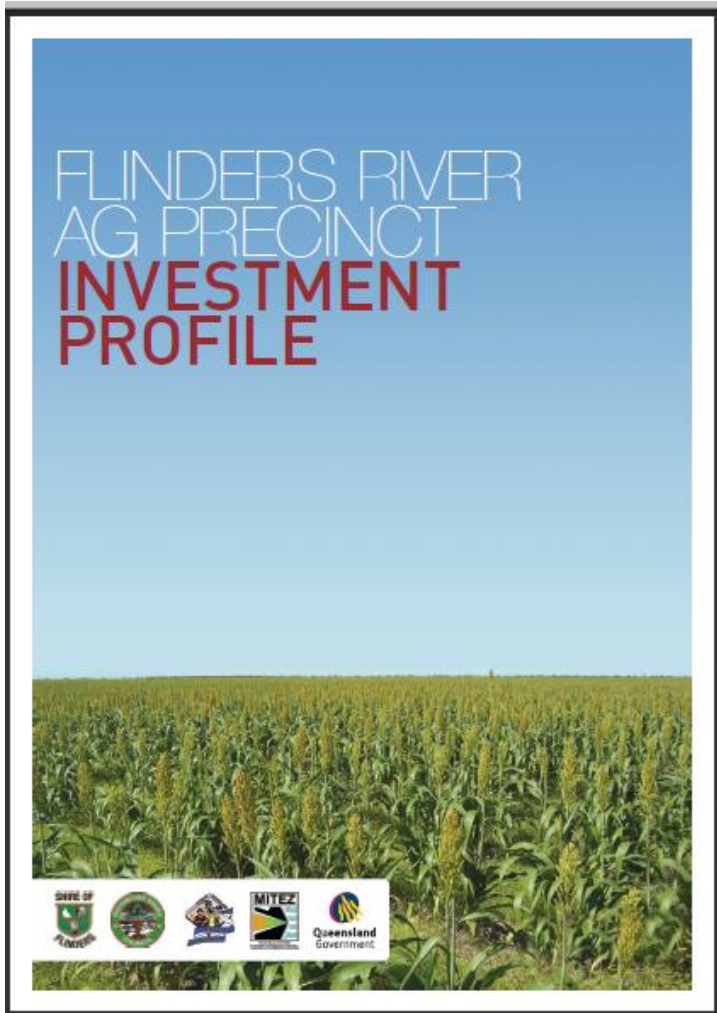
Cane harvesting – Lower Burdekin



Burdekin Falls dam

- significant government investment in primary infrastructure
- effective production and processing supply chains

New investment requires confidence



- The challenges and uncertainties of northern agriculture deter investment
- Given the environment it can take time to generate returns on investment – need patient capital and build in the possibility of early failures
- Scaling up at the right pace

Questions

2. Opportunities for beef production

What are the opportunities for the beef industry?

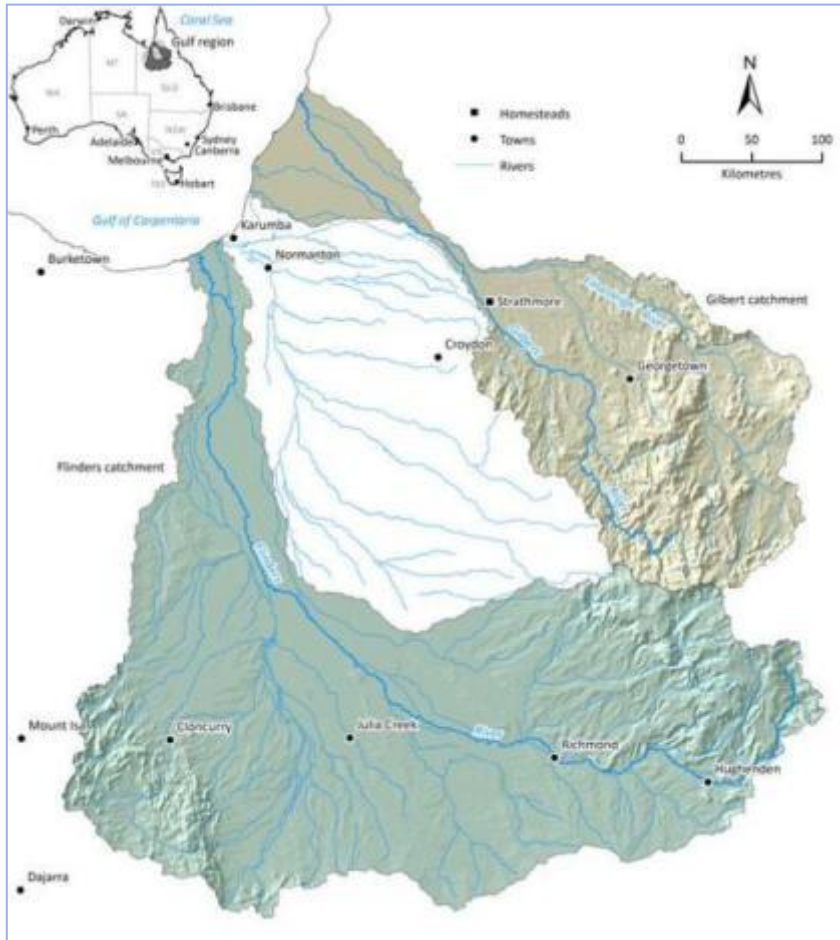
- large scale schemes vs mosaic irrigation
- forages for beef vs diversifying into crop production

Areas of irrigated pasture and grain crops in northern Australia

Region	Total ha (m)	Irrigated pasture and grain (ha)	% pasture
Central & Central West Qld	47.50	4890	61
Nth and Far Nth Qld	19.09	11327	49
NW Qld	26.77	2019	69
Barkly	37.56	0	0
Katherine-VRD	16.79	572	70
Kimberley	19.01	1724	20
Pilbara	13.78	890	95

Data sourced from ABARES – Water Use on Australian Farms 2010
Pilbara numbers include Rio Tinto Hammersley project

Flinders-Gilbert Agricultural Resource Assessment



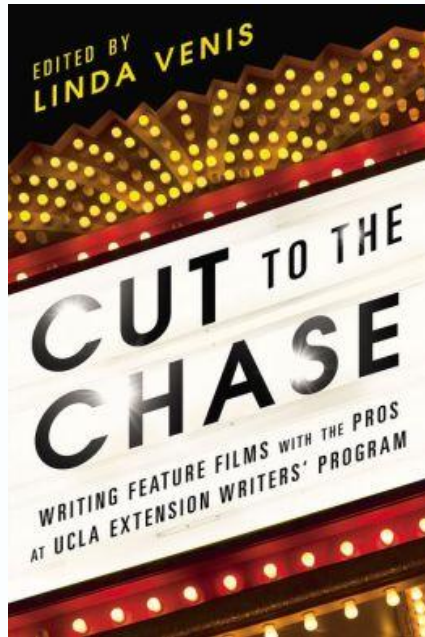
- part of NQIAS
- 155,000 km²
- >90% pastoral
- ca 7,200 people
- <1000 ha irrigated agriculture

What was done?



- 1. Identified and evaluated soil & water resources;**
- 2. Quantified productivity & scale of irrigated agriculture opportunities;**
- 3. Quantified costs & benefits and their distribution amongst different users**

Key findings



1. despite close proximity, catchments vary very widely
2. Flinders: farm dams can enable 10-20,000 ha of irrigation in 70-80% of years
3. Gilbert: instream dams can enable 20-30,000 ha of irrigation in 85% of years
4. significant water use would amplify ecological challenges of dry years, moderate impact in 'normal' years

General findings

- soils often better & more extensive than previously considered
- water supply unreliable
- available water small % of total
- significant water capture opportunities limited in scale & distribution
- despite challenges, irrigated agriculture opportunities exist
- must work hard to locate & separate opportunity from risk



Large scale schemes – key issues and opportunities

- High capital costs to establish dams, channels and associated infrastructure (\$0.5 to 1.0Bn for a storage capable of irrigating 20-30,00 ha)
- Assuming full capital costs incorporated in water charges then \$250/ML. With 8 ML/ha for a forage crop, water costs amount to \$2000/ha!!
- Assuming the public purse provides dam and water conveyancing only operating costs for water then \$36/ML. Irrigated forage crops become viable for hay production at \$100/t-\$150/t
- Opportunities may lie in integration of cropping systems with beef production systems e.g. fallow forage crops in sugar rotation, grain for local feedlot fattening as too costly to freight coarse grains long distances
- Infrastructure and farm machinery that accompanies a large irrigation scheme can trigger opportunities nearby in opportunistic dryland farming for grain, hay or forage production

Mosaic agriculture

- targeted areas of irrigation drawing on local water supplies including groundwater, streams/rivers, ring tanks



Mosaic Agriculture – Key Opportunities

1. A high proportion of northern Australia's pastoral properties may have enough suitable soils and water for small-scale irrigation
2. Ready availability of forage grown on property could drive positive change to beef production systems and boost productivity at the enterprise scale.
3. Mosaic irrigation to enhance the beef industry is not dependent on large scale public investment in infrastructure
4. The environmental impacts of mosaic irrigation development will be small compared with those of the cattle industry itself and other land uses



Mosaic agriculture – capital costs

- Capital costs are approximately \$7,000 to 10,000/ha

East Kimberley example – sourced from Petty (2011)

	\$/ha
Clearing (assuming light timber)	588
Ground preparation	767
Irrigation (bore, pump, pivot)	7000
Project management	1025
Total	9380

Mosaic agriculture – returns on investment

Nth Qld scenario – finishing export Ox (300kg carcasse) by 30-36 months

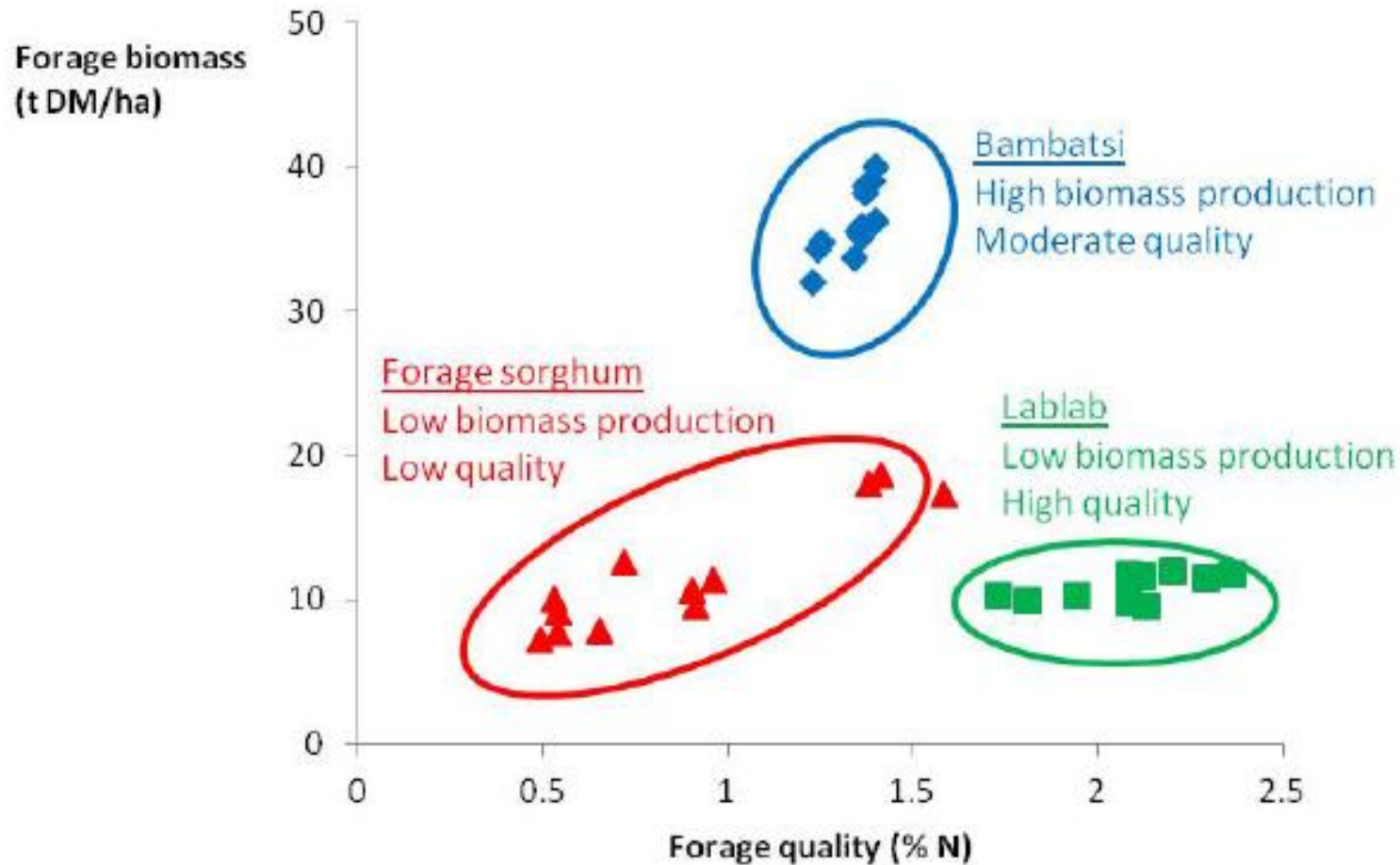
	Baseline	Lablab (High N)	Bambatsi (High yield)	Forage sorghum
Scale of irrigation (ha)	-	80	50	150
Capital investment	-	\$676,000	\$422,750	\$1,300,000
Annual costs – irrigation (\$)	-	\$46,728	\$32,205	\$80,115
Annual costs – capital (\$)	-	\$65,166	\$40,729	\$122,186
Total stock (AE)	2,867	2,595	2,644	2,647
Gross Margin/AE (\$)	\$122	\$170	\$182	\$155
Average Net Profit (\$)	\$155,000	\$197,236	\$257,295	\$126,588
Return on Investment (%)	-	6	24	-2

Mosaic agriculture – returns on investment

Kimberley scenario – early weaning to lift calving rates and producing 350 kg live export animals by 24 months

	Baseline	Lablab (High N)	Forage sorghum
Scale of irrigation (ha)	-	200	500
Capital investment	-	\$1,700,000	\$4,200,000
Annual costs – irrigation (\$)	-	\$129,820	\$297,050
Annual costs – capital (\$)	-	\$162,915	\$407,287
Total stock (AE)	10,876	10,897	11,929
Average Net Profit (\$)	\$25,687	\$216,492	\$-204,733
Return on Investment (%)	-	11	-5

Sensitivity to yield and quality of forage



Questions

3. Different options

Irrigated forage options - graze vs hay?

- grazing forages results in trampling or wastage of 40-50%
- hay crops can utilise 90% of what is grown
- value add of grazing into kg of beef assuming abattoirs are within reasonable distance for finished animals i.e. need well integrated supply chains
- hay crops need to be utilised within reasonable distance of production to be cost-effective for purchasers and demand will be finite within that distance



Scaling up mosaic agriculture

- 600 GL of groundwater and reliable, local surface supplies suitable for mosaic agriculture in northern Australia
- Assuming 10 ML/ha and 20 tonnes/ha of forage, that could finish 100,000 head per year at a value of \$1000/head
- Could add \$100M in gross value of production across the north



Diversification into crop production

Gross margins for a range of irrigated crops in the Flinders catchment (data sourced from FGARA Reports, 2014; assumes no capital costs and minimal freight costs and local cotton gin)

Crop	Price	Gross margin (\$/ha)
Lablab hay	\$160/tonne	1,044
Cotton	\$450/bale	2,387
Maize	\$280/tonne	1,221
Grain sorghum	\$230/tonne	516

Diversification into crop production

- higher returns than hay can be generated but not universally so
- distance to markets
- local processing facilities
- skills/capacity to undertake cropping operations
- support services for machinery



Key messages

- there are opportunities for irrigation and the beef industry in the north but they will be targeted and need careful planning
- capital required is significant
- need to scale up prudently and be financially prepared to cope with “learning” failures and bad luck e.g. poor seasons
- development of large scale agricultural schemes may provide options for integrated beef production systems (grain, pulses) and opportunistic dryland grain and hay crops
- mosaic agriculture - opportunities might lie in different market options or diversification into crops rather than boosting productivity of existing operations where returns on investment might be low
- it ain't for the faint-hearted!



Thank you

