CORIOLIS
research·consulting·strategy

# HOW DO WE INCREASE AG PRODUCTION?

## IN THE NWMP TO CREATE SIGNIFICANT NEW EMPLOYMENT

Presentation to the NWMP Stakeholder Advisory Committee; Mt. Isa, Queensland; *Monday, 17 June 2019*

# *AGENDA*

WHY ARE WE HERE?

WHAT PROBLEM ARE WE TRYING TO SOLVE? WHY AGRICULTURE?

WHAT DO WE HAVE TO WORK WITH?

HOW DO WE FIND NEW IDEAS BEYOND CATTLE?

WHAT IS THE SOLUTION?

HOW DO WE IMPLEMENT?

# *This research emerged from the North West Minerals Province Taskforce and the Strategic Blueprint for North West Queensland*


NOV 2015


JUL 2017

*Source: "A Strategic Blueprint for Queensland's North West Minerals Province; Supporting Strong And Prosperous Regional Communities", Queensland Government*

# *The Strategic Blueprint for North West Queensland identifies agriculture as having potential to grow and diversify the economy*

**VISION**
Strong and prosperous industries, businesses and communities in the North West Minerals Province

*STRATEGIC PRIORITY 1*
*Facilitating continued resources sector development*

**STRATEGIC PRIORITY 2**
**Diversifying the regional economy and creating employment opportunities**

*STRATEGIC PRIORITY 3*
*Working with businesses and communities to deliver integrated and appropriate services*

- *Support key enabling infrastructure*
- *Continue to support the development of the Jemena Northern Gas Pipeline*
- **Develop a regional economic diversification strategy for North West Queensland**
  - *Complete an infrastructure audit*
  - **Scope opportunities for increasing agricultural production**
  - *Investigate tourism opportunities*
  - *Improve the digital presence of regional start-ups and established businesses*
- **Support opportunities to leverage agriculture research projects**
- *Build entrepreneurial capacity for existing and emerging sectors*
- *Optimise employment opportunities -facilitate training and development*
- *Prioritise youth employment*

# *This research seeks opportunities for increasing agricultural production in the region to create significant new employment*


Key actions to be delivered in developing the strategy include:

**DEVELOP A REGIONAL ECONOMIC DIVERSIFICATION STRATEGY FOR NORTH WEST QUEENSLAND**

The Queensland Government will develop a long-term regional economic diversification strategy to leverage and identify development opportunities in key sectors including resources, agriculture, enabling infrastructure, tourism, and business and industry…

**SCOPE OPPORTUNITIES FOR INCREASING AGRICULTURAL PRODUCTION**

The state's North West presents unique prospects for further agricultural development. In recognising these opportunities across the Province, the Queensland Government will be developing an integrated North West Queensland agriculture plan. The plan will focus on continuing to grow a sustainable and diversified agricultural sector, and will be developed in collaboration with key stakeholders across the supply chain and linked with the broader regional economic diversification strategy.

…

**SUPPORT OPPORTUNITIES TO LEVERAGE AGRICULTURE RESEARCH PROJECTS**

The Queensland Government has already committed $1.5 million over three years to stimulate research activity to progress the development of new agriculture opportunities across North Queensland.

This funding will support opportunities to leverage industry-led research and development being undertaken through the Cooperative Research Centre for Developing Northern Australia for increased agriculture production across the Province and other parts of North Queensland.

The Cooperative Research Centre for Developing Northern Australia, currently being established in Townsville, is intended to provide a collaborative research platform to address challenges that have constrained agricultural and broader development in the north and includes a $75 million commitment over 10 years from the federal government.

*p17-19*

*Source: North West Minerals Province "A Strategic Blueprint for Queensland's North West Minerals Province"*

# *The province covers ten local government authorities in North West Queensland and associated linkages and supply chains*

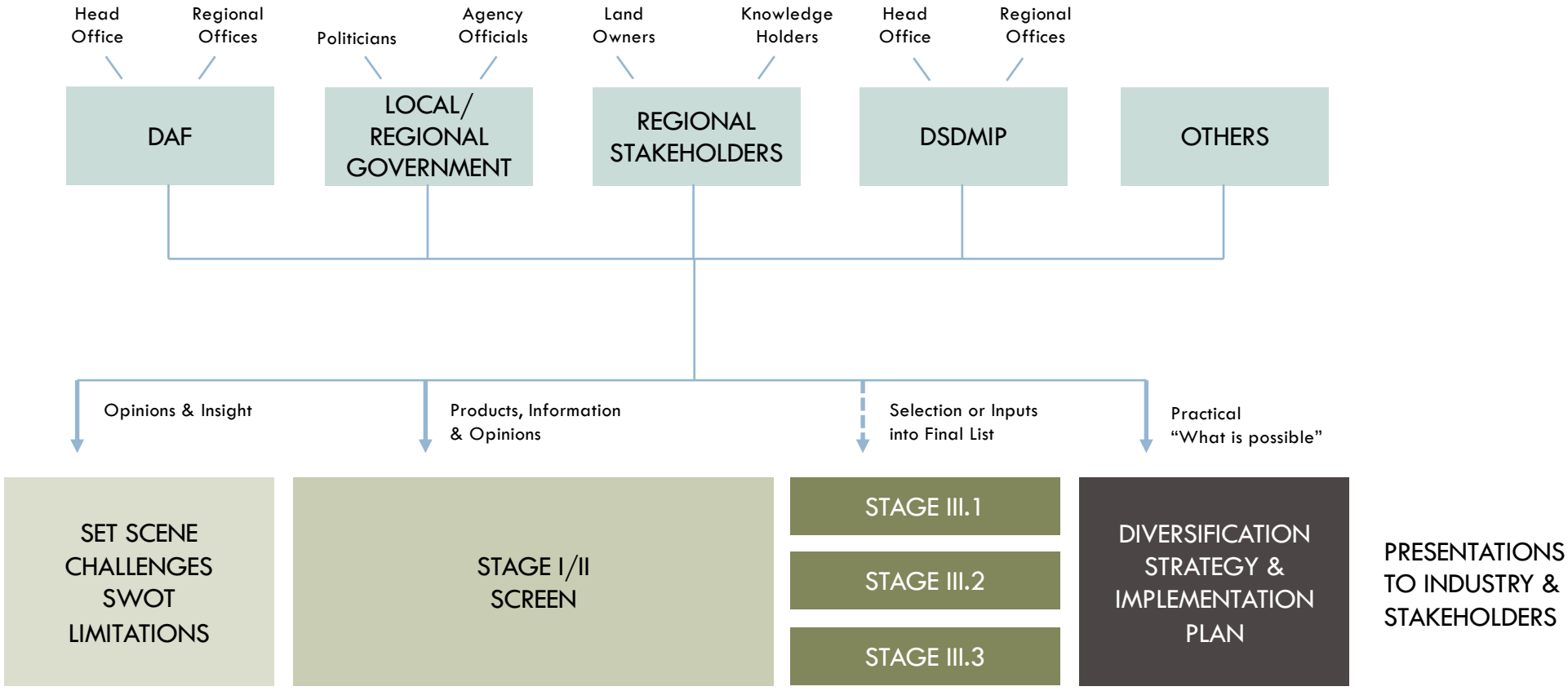
KARUMBA
Port


CAIRNS
International Airport
Cairns Airhub
Port

TOWNSVILLE
Airport
Upgraded Port
Road & Rail Hub

*Source: "A Strategic Blueprint for Queensland's North West Minerals Province", Queensland Government; adapted by Coriolis*

# *We have conducted a robust, multi-stage process, including significant stakeholder engagement*



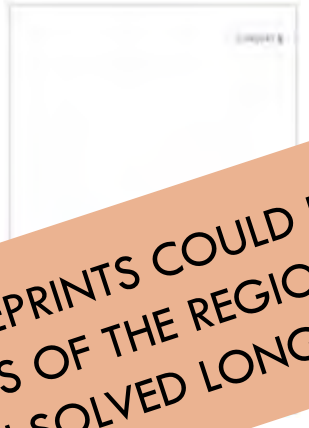

*Source: Coriolis*

# *This work builds on past government strategies, reports and blueprints covering part or all of the region*

## EXAMPLE STRATEGIES AND PLANS

*Select recent strategies; last ten years*






IF STRATEGIES & BLUEPRINTS COULD HAVE SOLVED THE PROBLEMS OF THE REGION, THEY WOULD HAVE BEEN SOLVED LONG AGO



*Source: various websites; Coriolis analysis*

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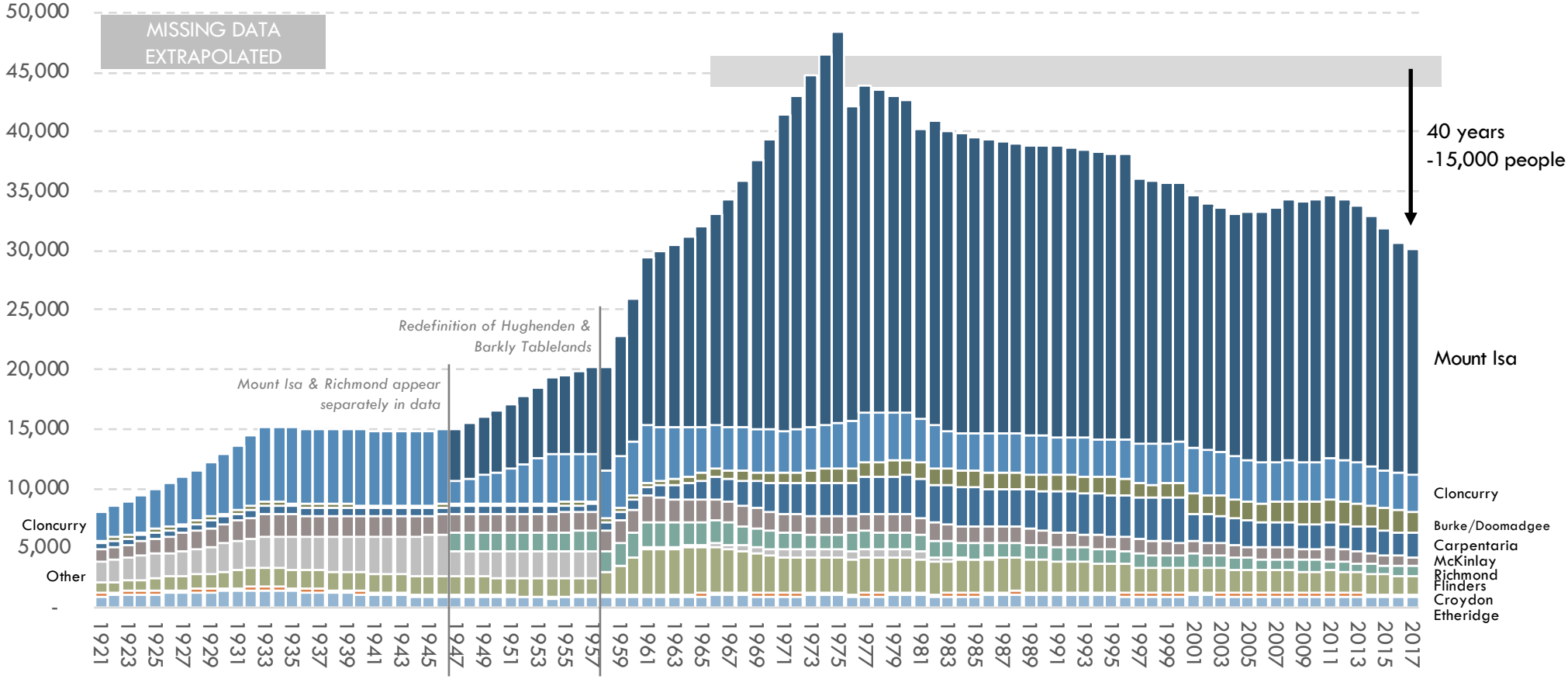
# *Total regional population has been declining since the mid 1970's; longer for some areas*

## REGIONAL POPULATION IN NORTH WEST QUEENSLAND

*People; 1921-2017*

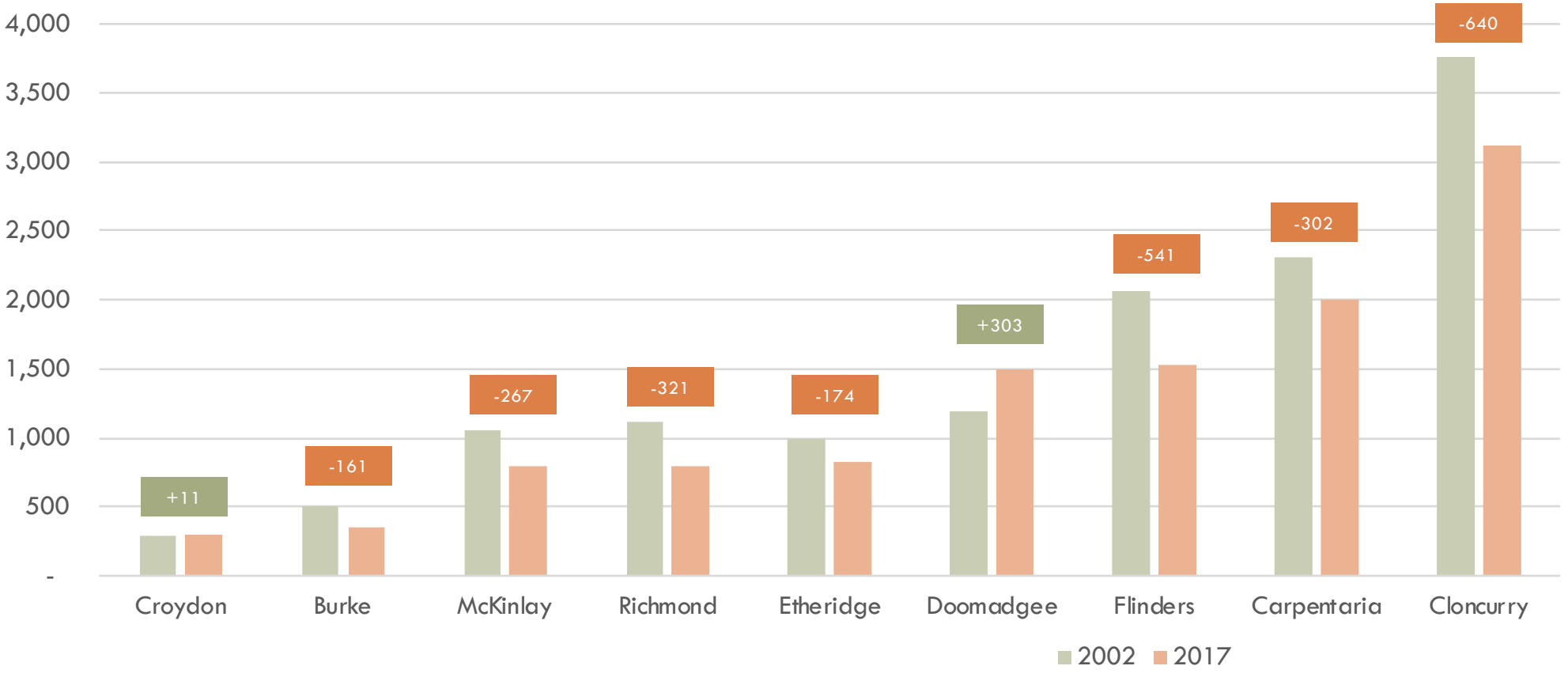



*Source: wide range of ABS (and predecessor organisation) publications; Coriolis modelling & analysis*

# *Regional population is trending down across most regions*

## REGIONAL POPULATION IN NORTH WEST QUEENSLAND EXCLUDING MOUNT ISA

*People; 15y change; 2002 vs. 2017*

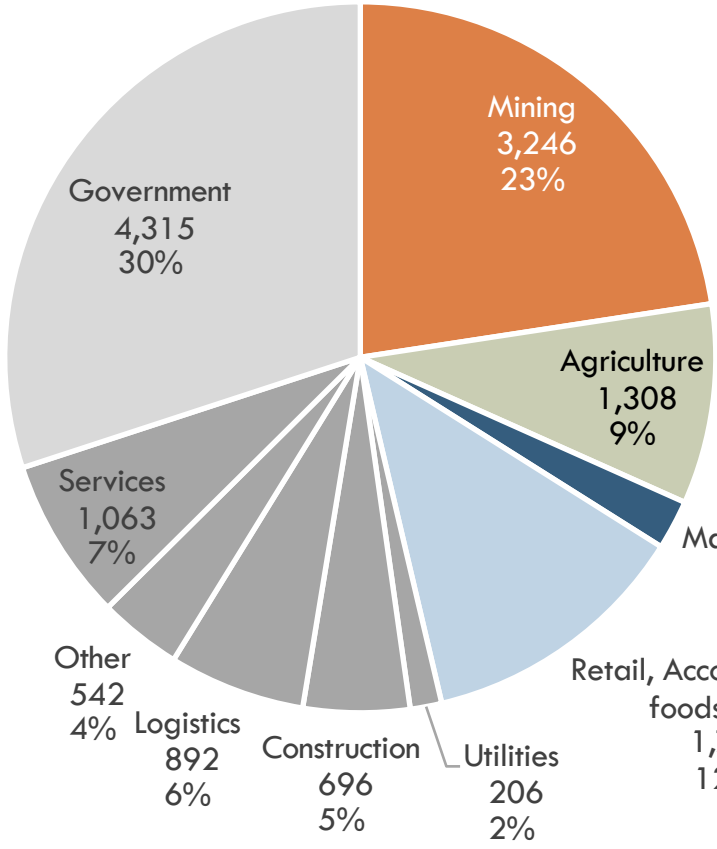



*Source: various ABS publications; Coriolis analysis*

# *Why agriculture? Agriculture has the potential to "create" significant new employment*

## REGIONAL EMPLOYMENT IN NORTH WEST QUEENSLAND BY SECTOR

*People; 2016*




**54%**

Primarily dependent on regional population rather than "creating" new employment

**34%**

Mining, agriculture and manufacturing are the key sectors that can "create" significant new regional employment

**12%**

Primarily locals, but also directly benefits from tourism

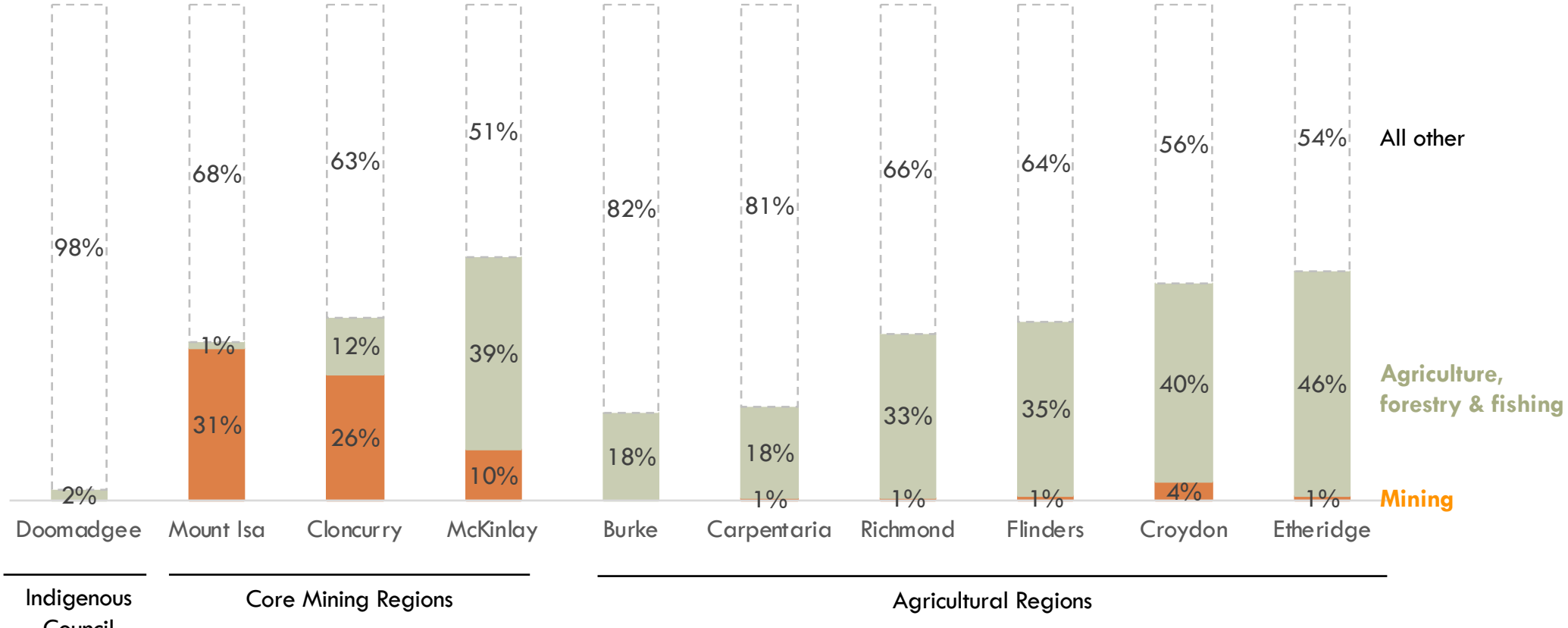
TOTAL = 14,370 people employed

*Source: ABS Regional Statistics by LGA – Economy and Industry; Coriolis analysis*

# *Agriculture is the major employer outside Mount Isa/Cloncurry*

## SHARE OF TOTAL REGONAL EMPLOYMENT IN MINING & AGRICULTURE

*% of employed persons; 2016*

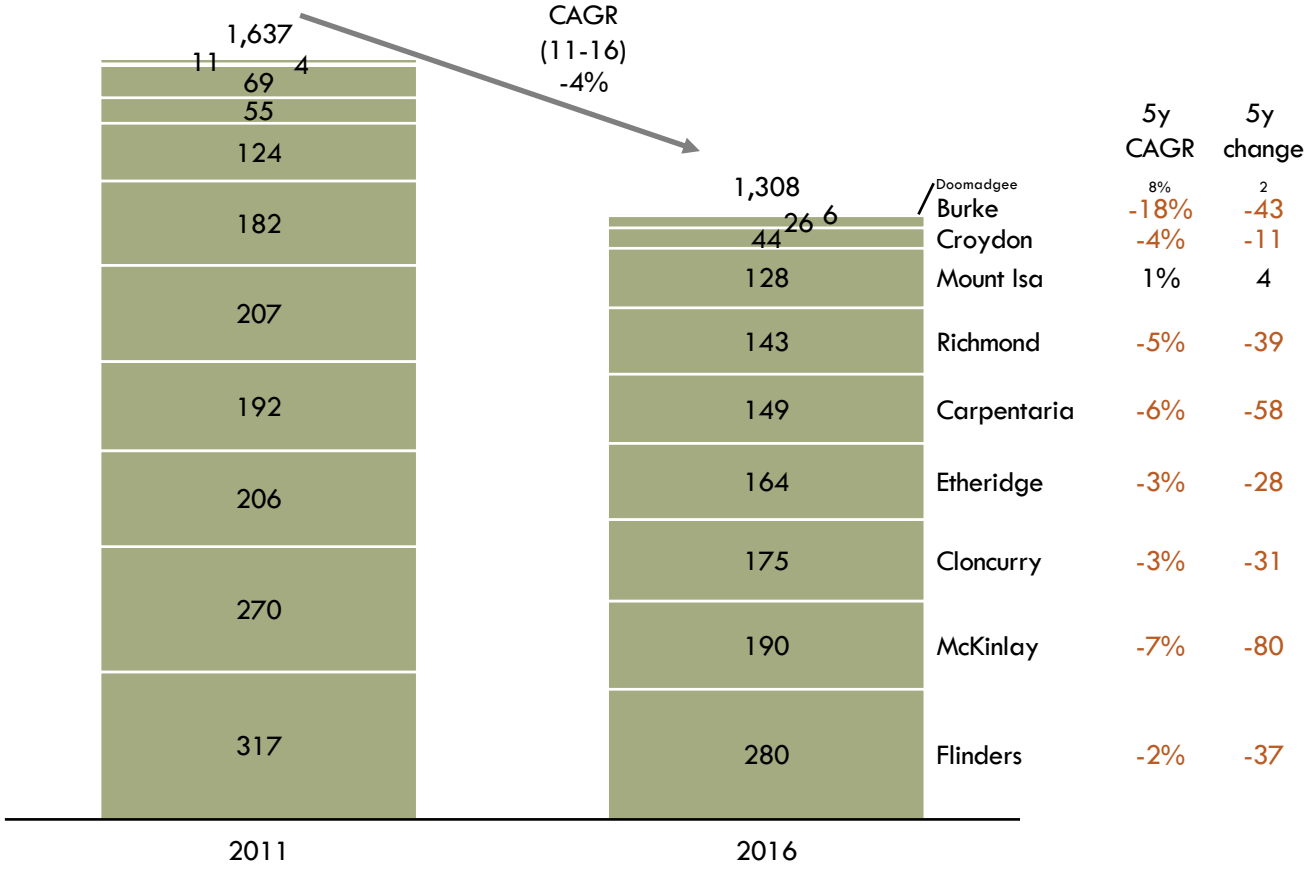



*Source: ABS Regional Statistics by LGA – Economy and Industry; Coriolis analysis*

# *Unfortunately regional agricultural employment has been falling at 4% per year, primarily due to changes in the cattle sector*

## EMPLOYMENT IN AGRICULTURE, FORESTRY & FISHING IN NORTH WEST QUEENSLAND

*People; 2011 vs. 2016*




| | 5y CAGR | 5y change |
|---|---|---|
| Doomadgee | 8% | 2 |
| Burke | -18% | -43 |
| Croydon | -4% | -11 |
| Mount Isa | 1% | 4 |
| Richmond | -5% | -39 |
| Carpentaria | -6% | -58 |
| Etheridge | -3% | -28 |
| Cloncurry | -3% | -31 |
| McKinlay | -7% | -80 |
| Flinders | -2% | -37 |

KEY DRIVERS

Drought
Consolidation
Productivity
Changing Activities
Changing Land Use

*CAGR = Compound Annual Growth Rate; Source: ABS Regional Statistics by LGA – Economy and Industry; Coriolis analysis*

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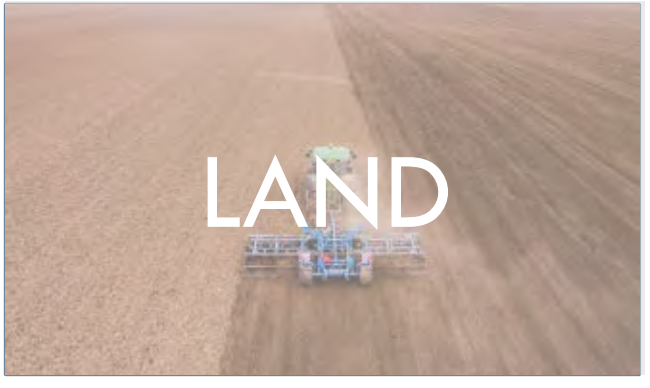
*Only North West Queensland can deliver a region that combines a modern, developed economy with African climatic conditions*





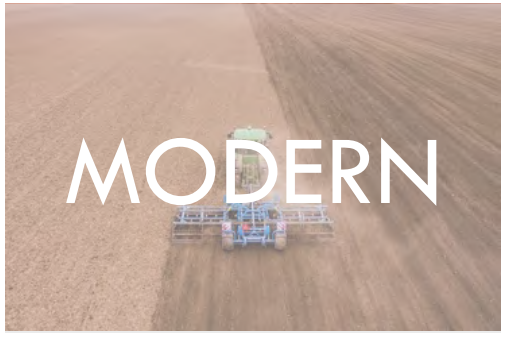





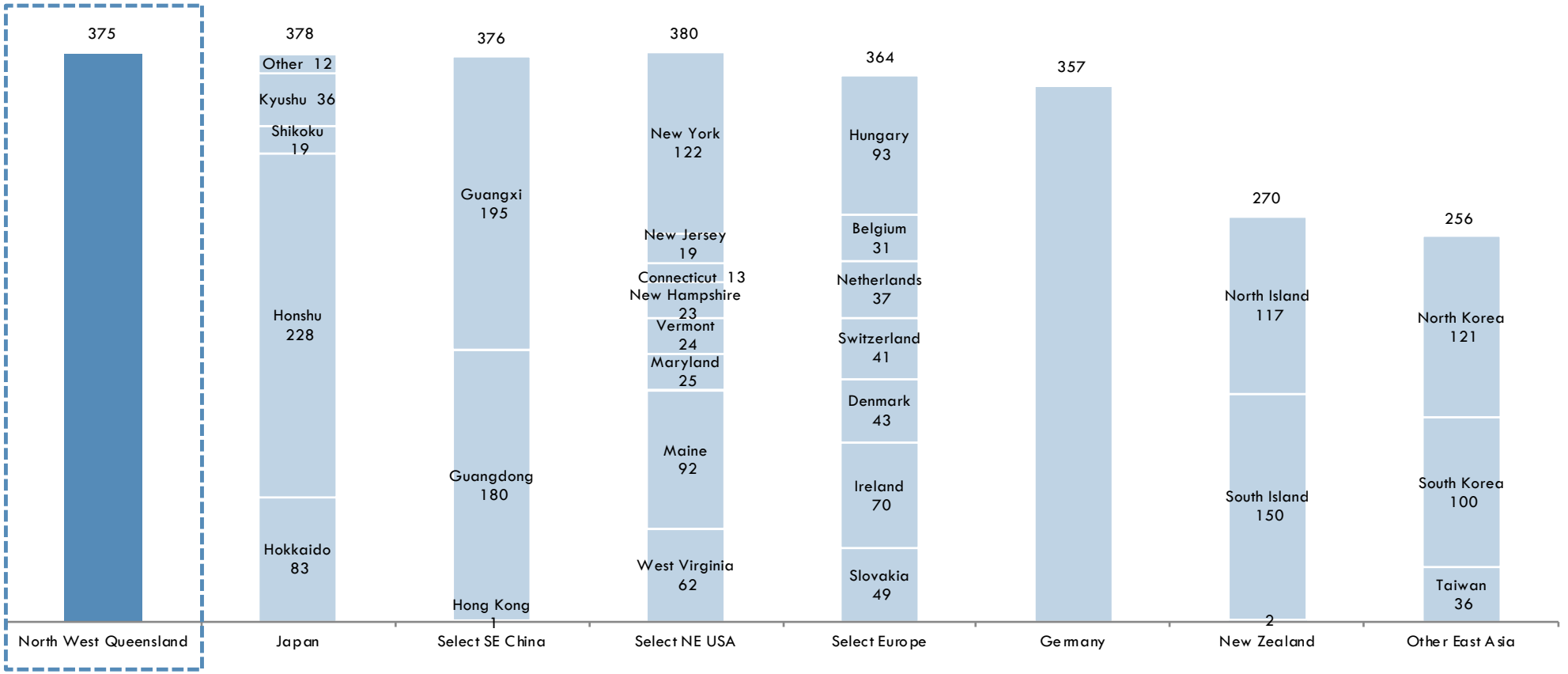


*Photo credit: Dollar Photo purchased by Coriolis Research*

# *North West Queensland covers a vast area the size of Japan or Germany*

## TOTAL AREA: NORTH WEST QUEENSLAND VS. SELECT REGIONS

*$Km^2$; 000; 2018*

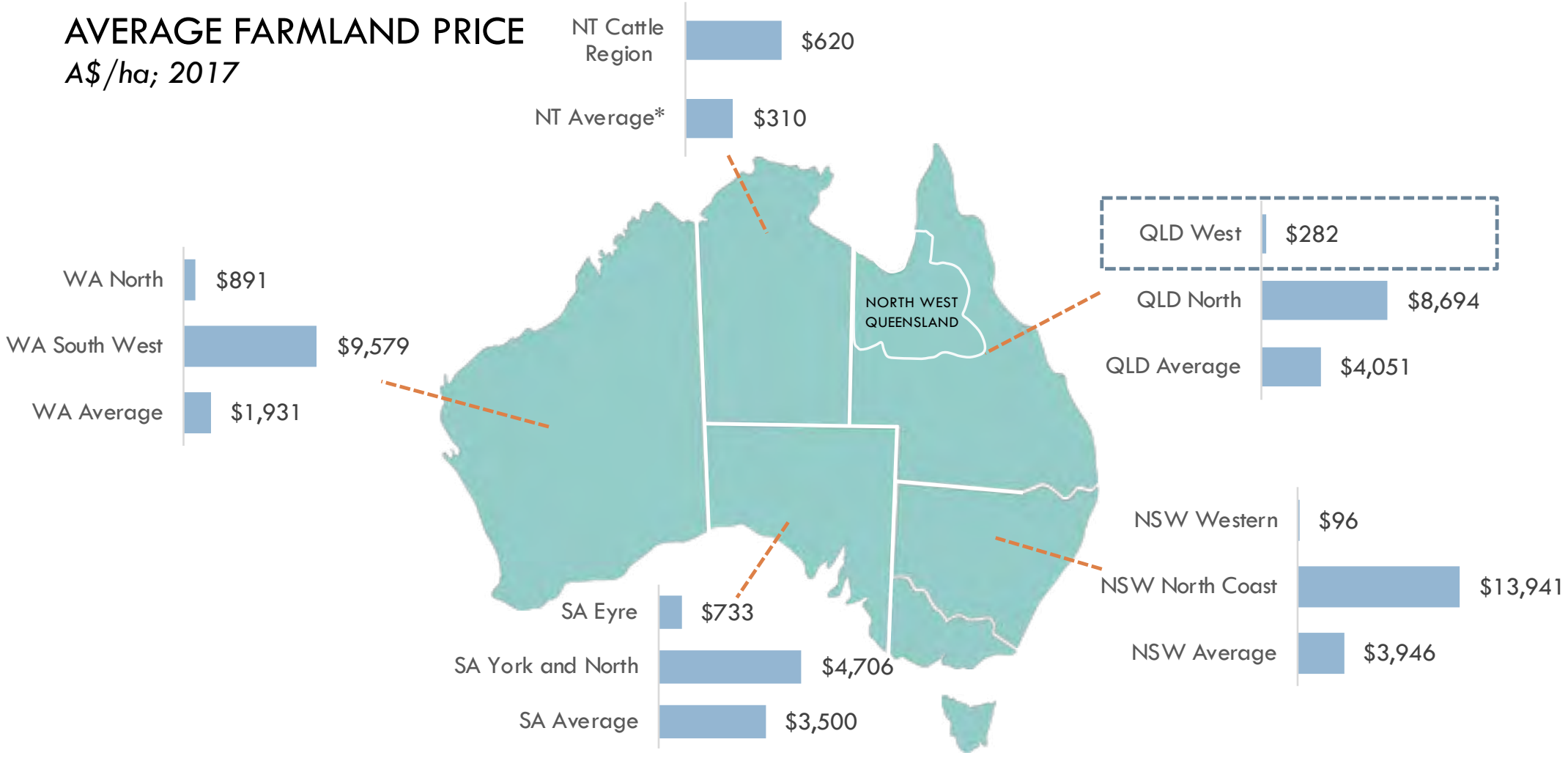



*Source: CIA World Fact Book; Wikipedia; Coriolis analysis*

# *Land is cheap compared with other parts of Australia*

## AVERAGE FARMLAND PRICE

*A$/ha; 2017*

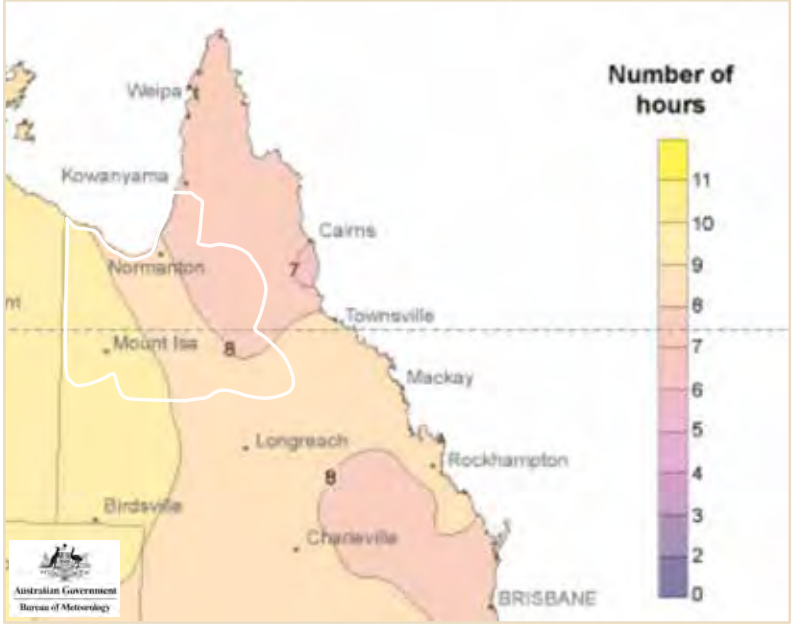



**NT Median Indexed; Source: Rural Bank, Australian Farmland Values; Coriolis analysis*

# *The region gets high sunshine hours and has warm average temperatures*

## AVERAGE DAILY SUNSHINE HOURS

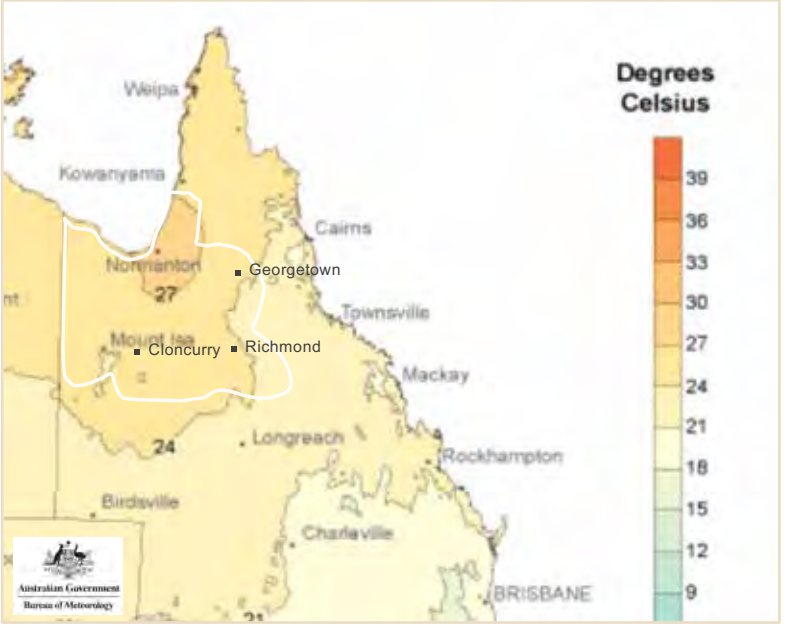
*Annual, 2018*




Average 7-9 hrs

## AVERAGE DAILY MEAN TEMPERATURE

*Annual; temperature; °C*

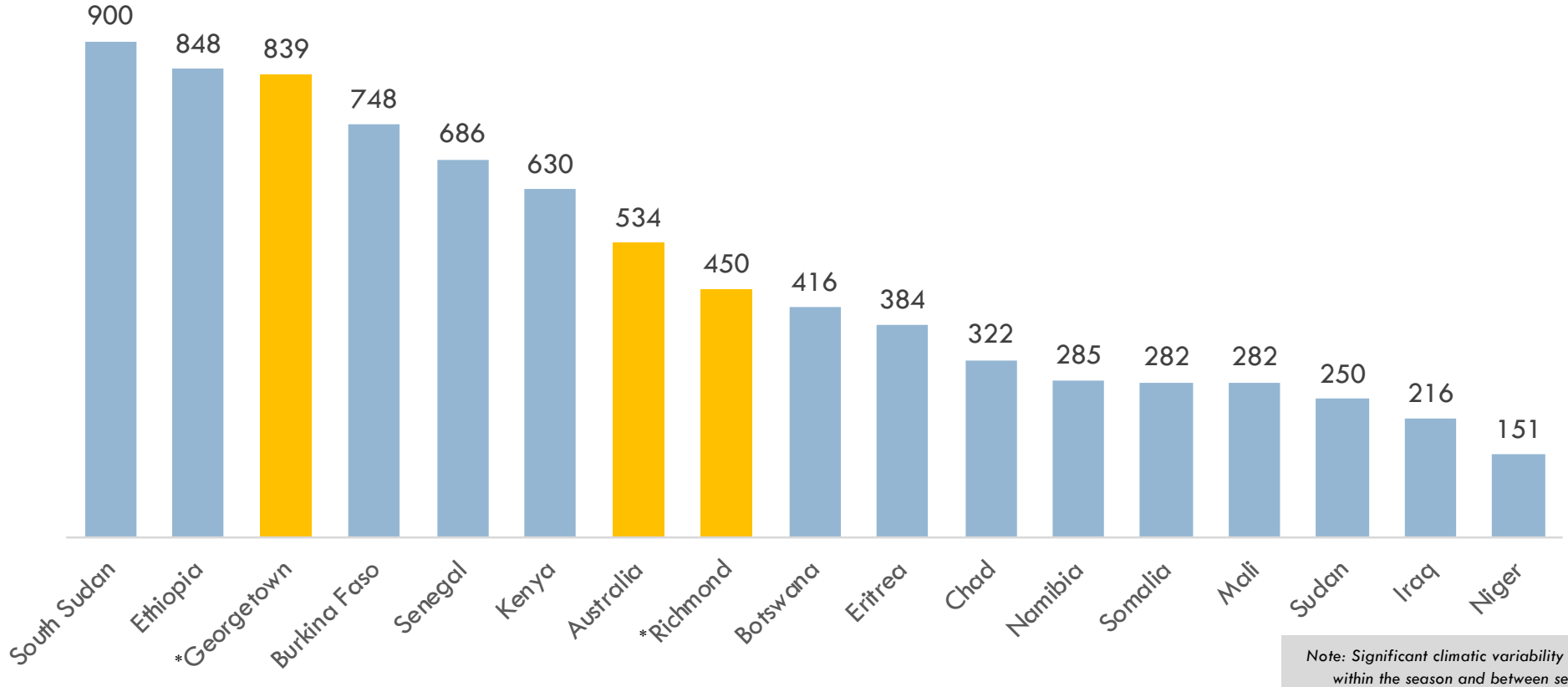



| | Max. | Min. | Over # years |
|---|---|---|---|
| Normanton | 42.9 | 6.7 | 18 |
| Cloncurry | 46.9 | 2.9 | 25 |
| Richmond | 45 | -1 | 21 |
| Georgetown | 42.8 | 0.5 | 14 |

# *While the area is not a tropical paradise, it does receive more rain than many climatic peer group countries*

## TOTAL AVERAGE ANNUAL RAINFALL NORTH WEST QUEENSLAND VS CLIMATIC PEERS

*Average precipitation in depth; mm/year; 2014*



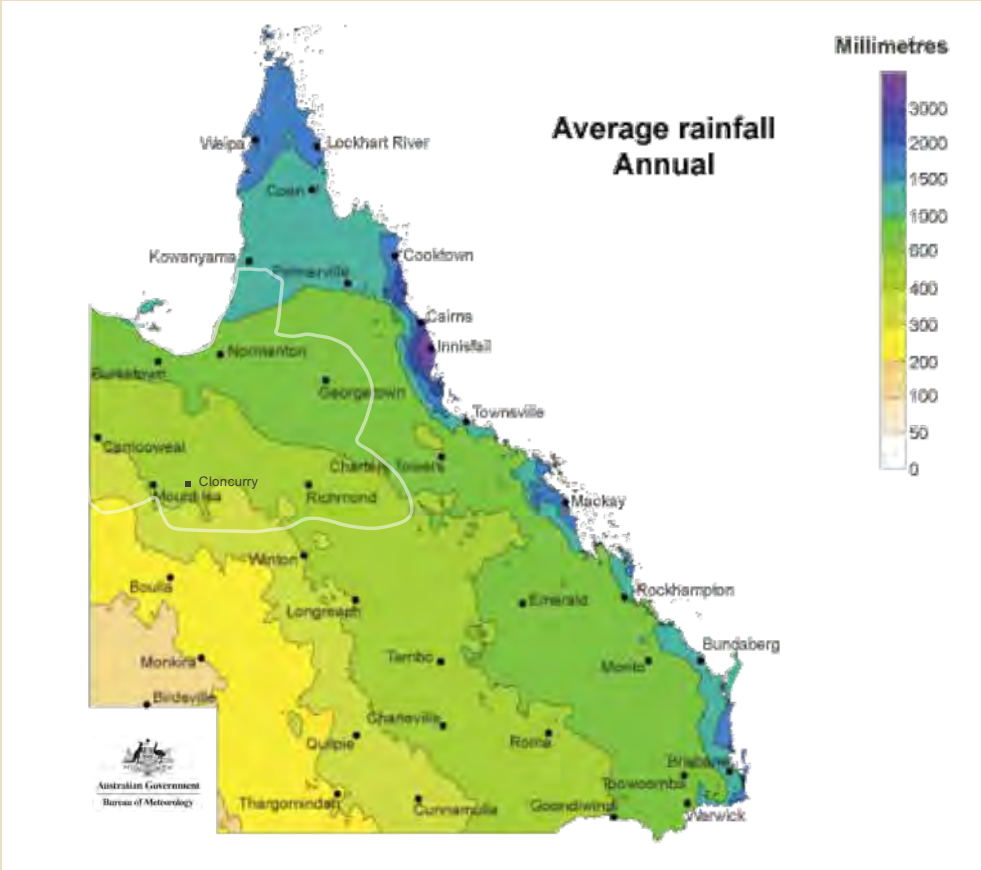

*Note: Significant climatic variability apparent within the season and between seasons*

**Georgetown 14 year average; Richmond 21 year average; Source: World Bank; Bureau of Meteorology, Australia; Coriolis analysis*

# *However, rainfall varies significantly by location, by season…*

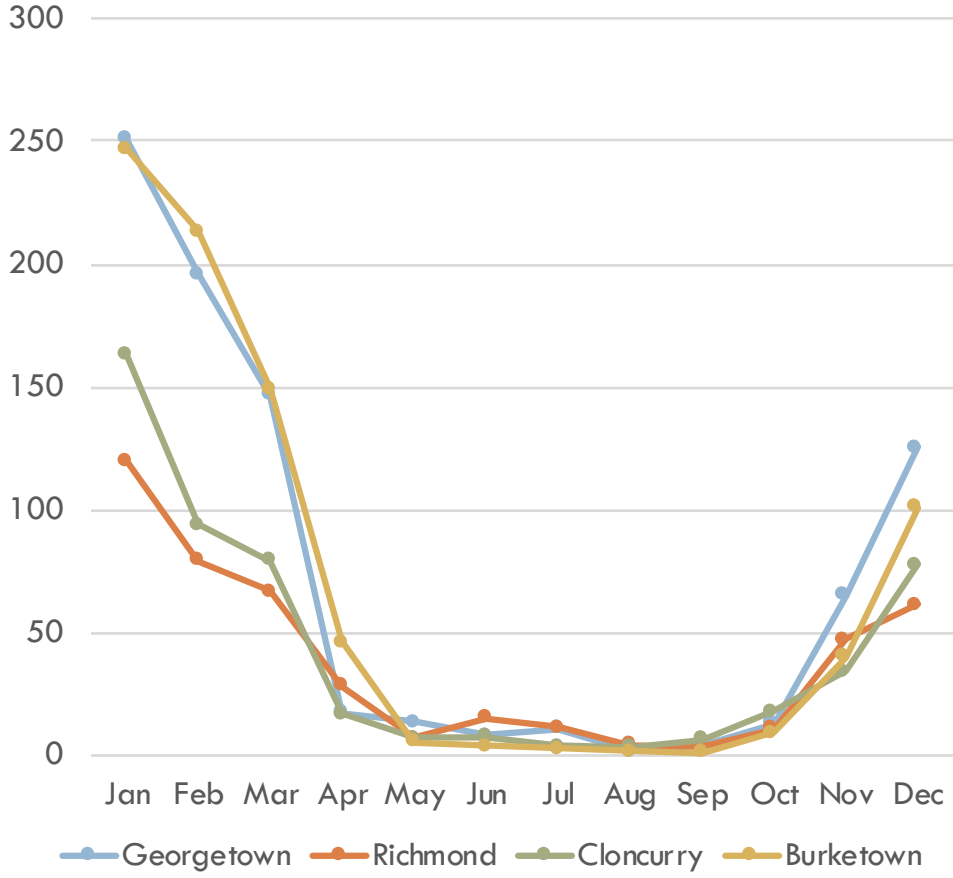
## AVERAGE ANNUAL RAINFALL

*Annual; average over 30 years*




## MEAN MONTHLY RAINFALL BY AREA

*mm; long term**

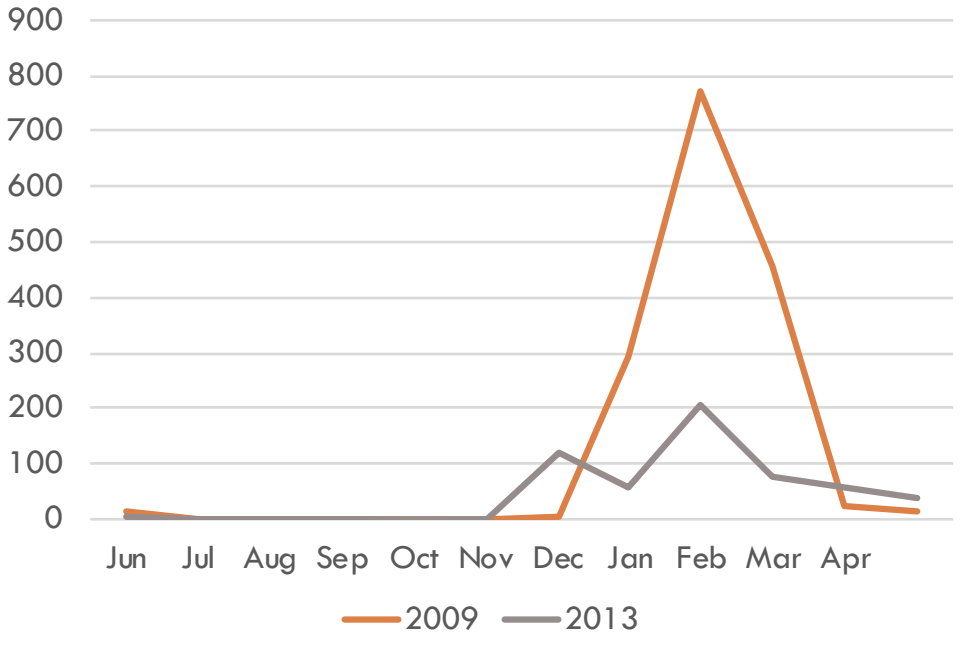



** Georgetown 14 year average, Richmond 21 year average; Cloncurry 25 year average; Burketown 17 year average; Source: Commonwealth of Australia - Bureau of Meteorology; CC3.0; modified by Coriolis; https://creativecommons.org/licenses/by/3.0/au/*

# ...and year to year

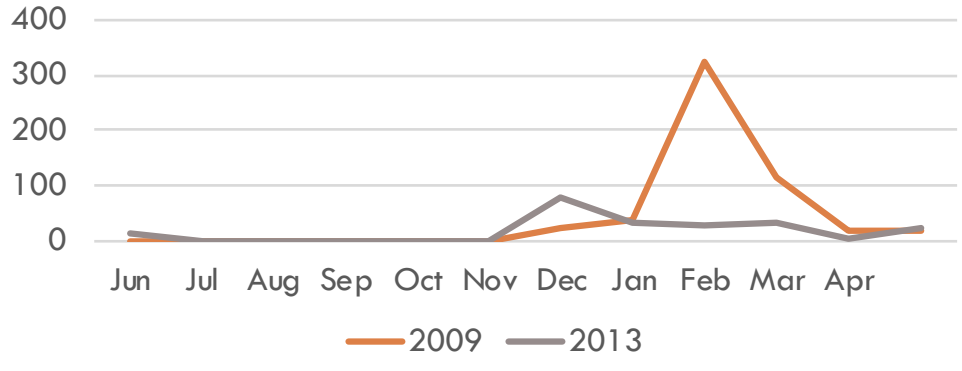
## GEORGETOWN TOTAL MONTHLY RAINFALL

*mm/total rainfall* 2009vs2013*




## RICHMOND TOTAL MONTHLY RAINFALL

*mm/total rainfall* 2009vs2013*

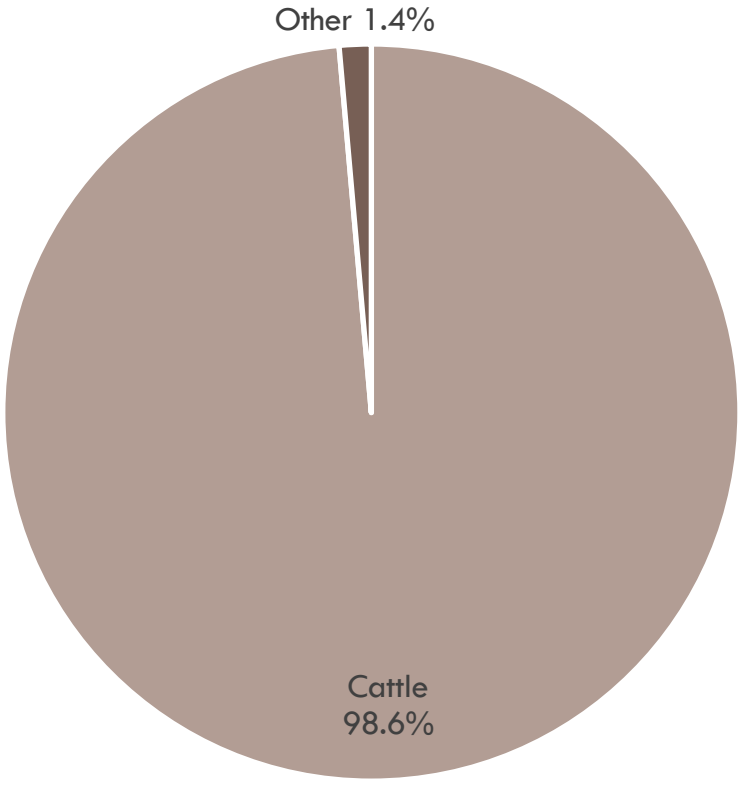



** Georgetown 14 year average, Richmond 21 year average; Source: Commonwealth of Australia - Bureau of Meteorology*

# *99% of regional agricultural production currently comes from cattle, with a regional turnoff of around 800k head/year*

## VALUE OF REGIONAL AGRICULTURE

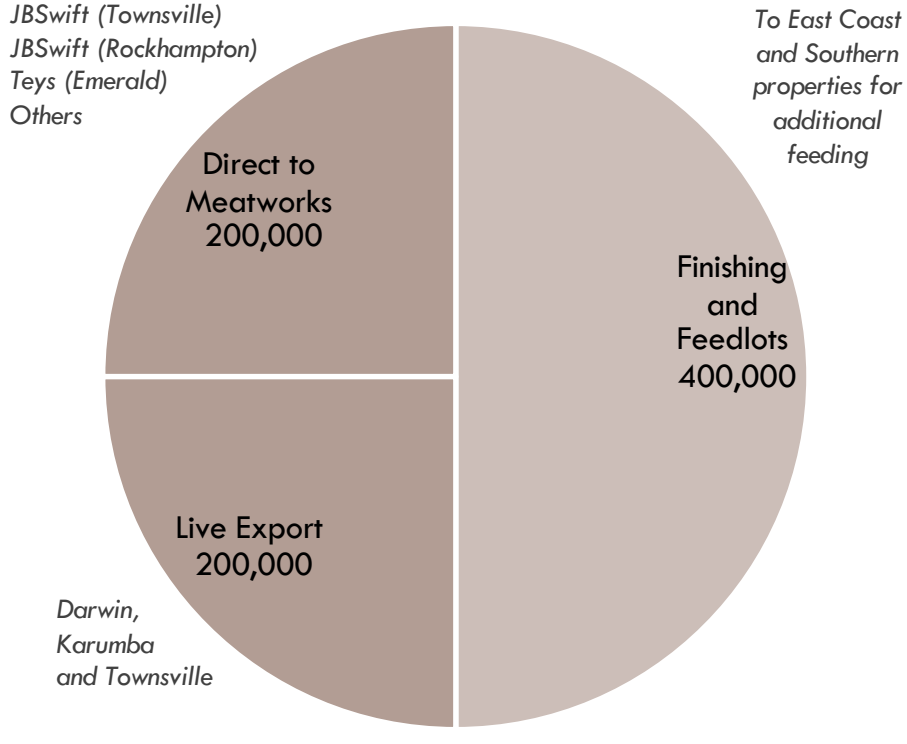
*GVP; 2016/17*




TOTAL VALUE: A$780m

## REGIONAL CATTLE TURNOFF BY DEST.

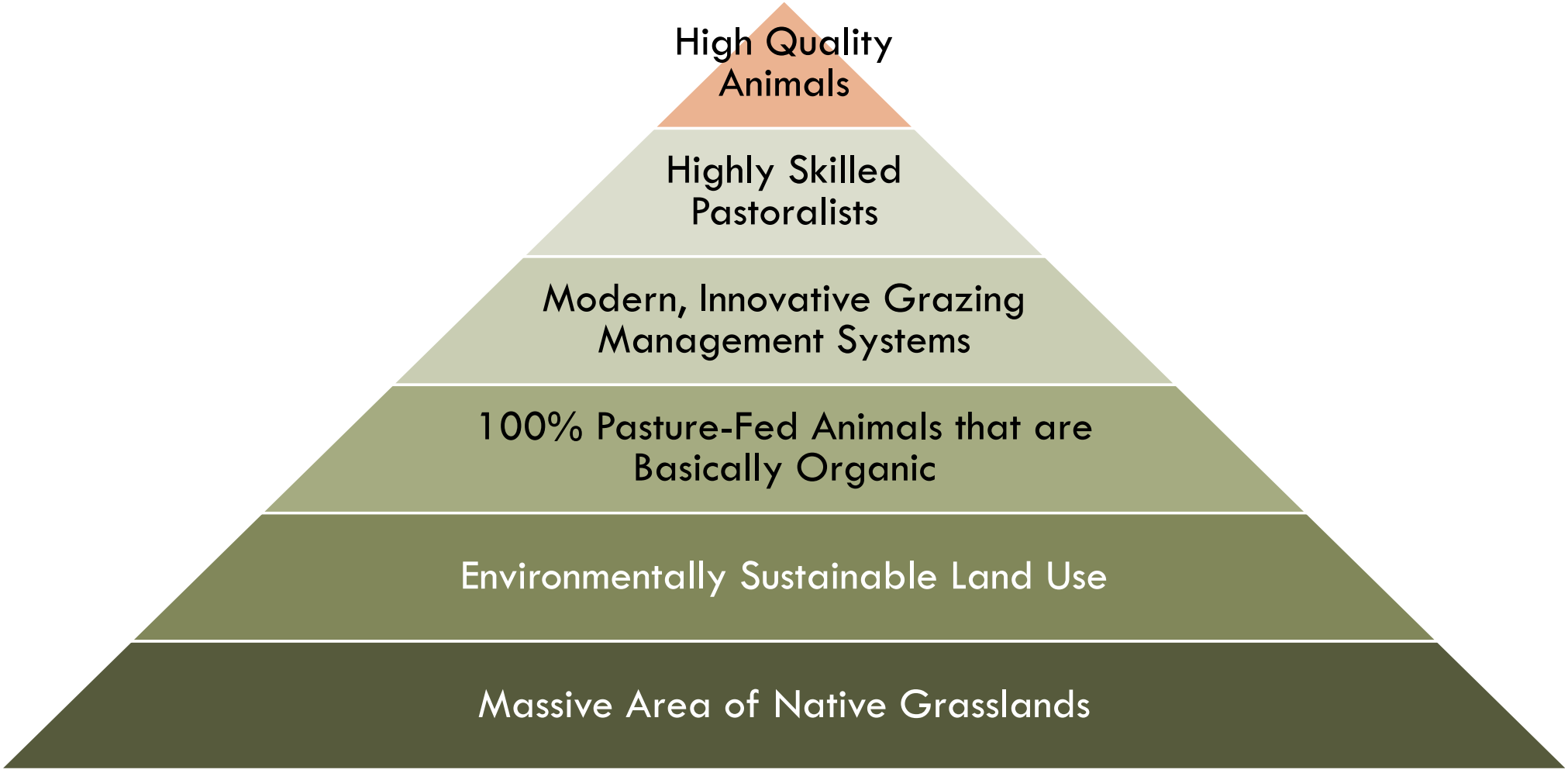
*Head of cattle; 2017*




TOTAL = 800,000 head

*Source: ABS: Value of Agricultural Commodities Produced; Coriolis estimates and assumptions*

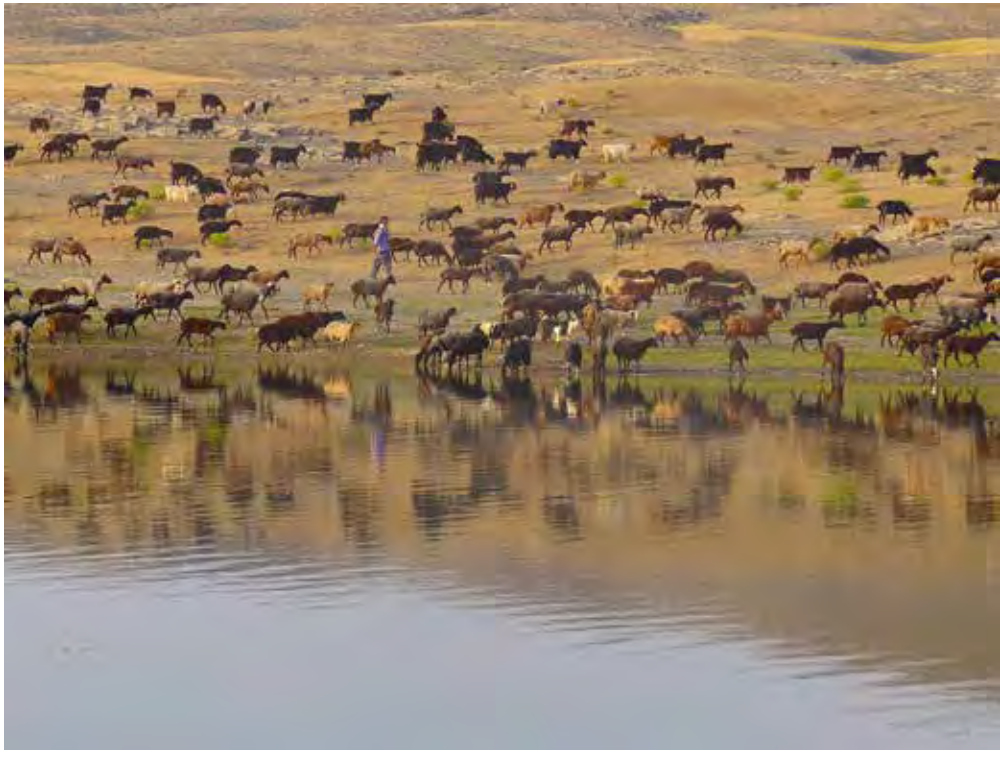
# *North West Queensland's strength in cattle is built on solid foundations*




*Source: Coriolis analysis*

# *However, regional agricultural production is currently the equivalent of "large scale herding" in Africa*

HERDING IN AFRICA



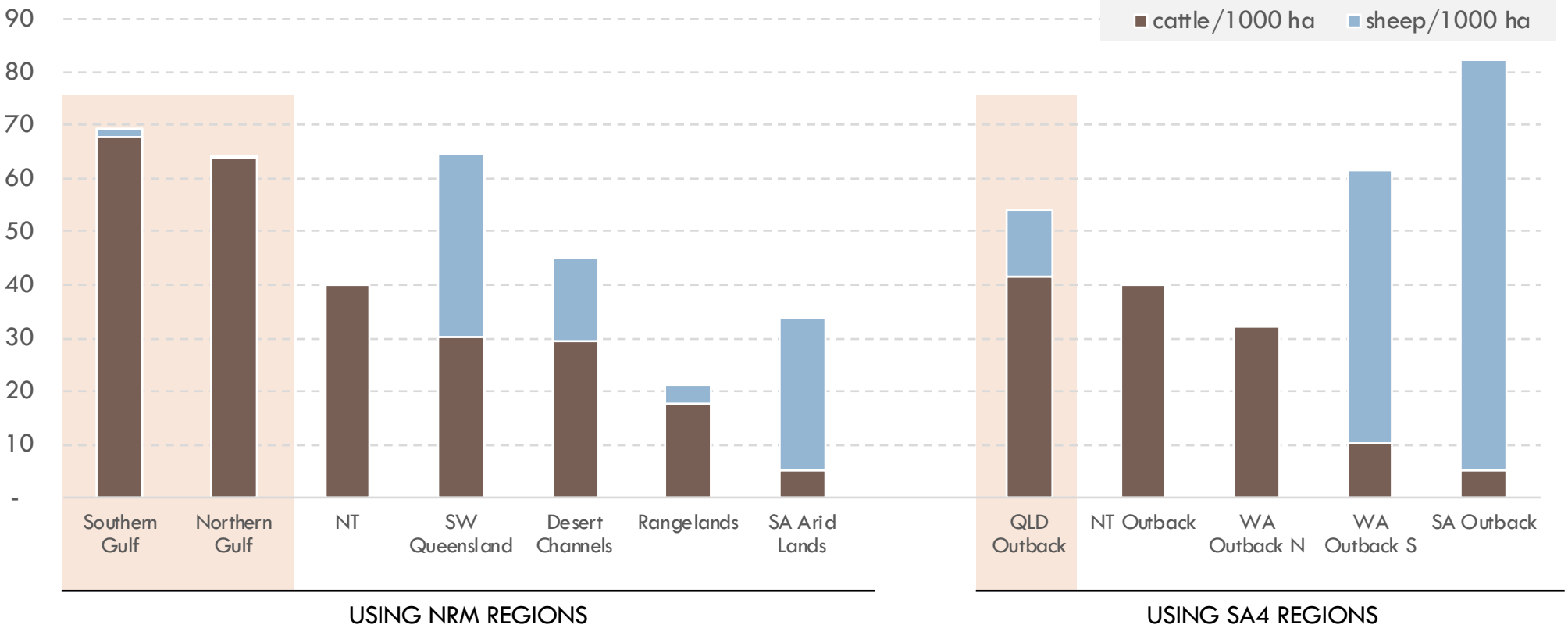
"EXTENSIVE GRAZING" IN AUSTRALIA

*Photo Credit: CC0 Creative Commons*

# *North West Queensland is already stocking cattle at higher densities than comparable AU regions*

## NUMBER OF CATTLE & SHEEP PER 1000 HECTARES OF AGRICULTURAL HOLDINGS

*Head/1000 ha; 2017*

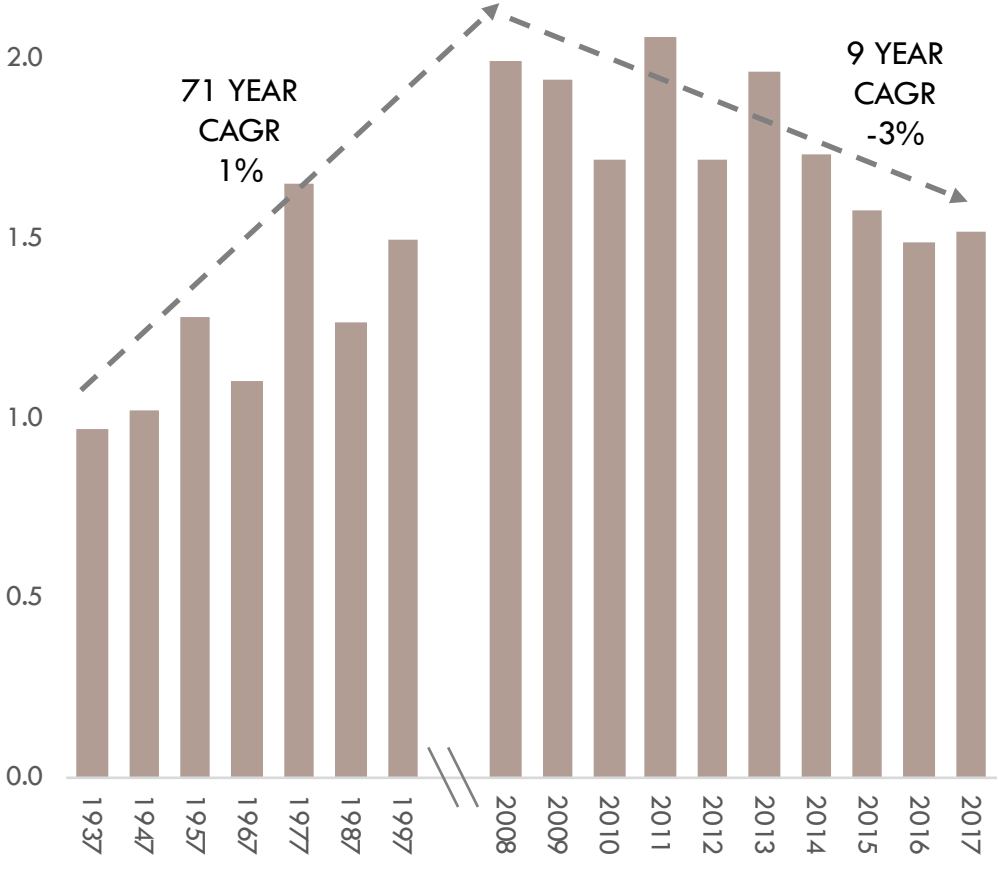



*Source: ABS 7121.0 2016-17; Coriolis analysis*

# *Regional cattle numbers have stabilised recently, following a long period of growth achieved, in part, by "replacing sheep"*

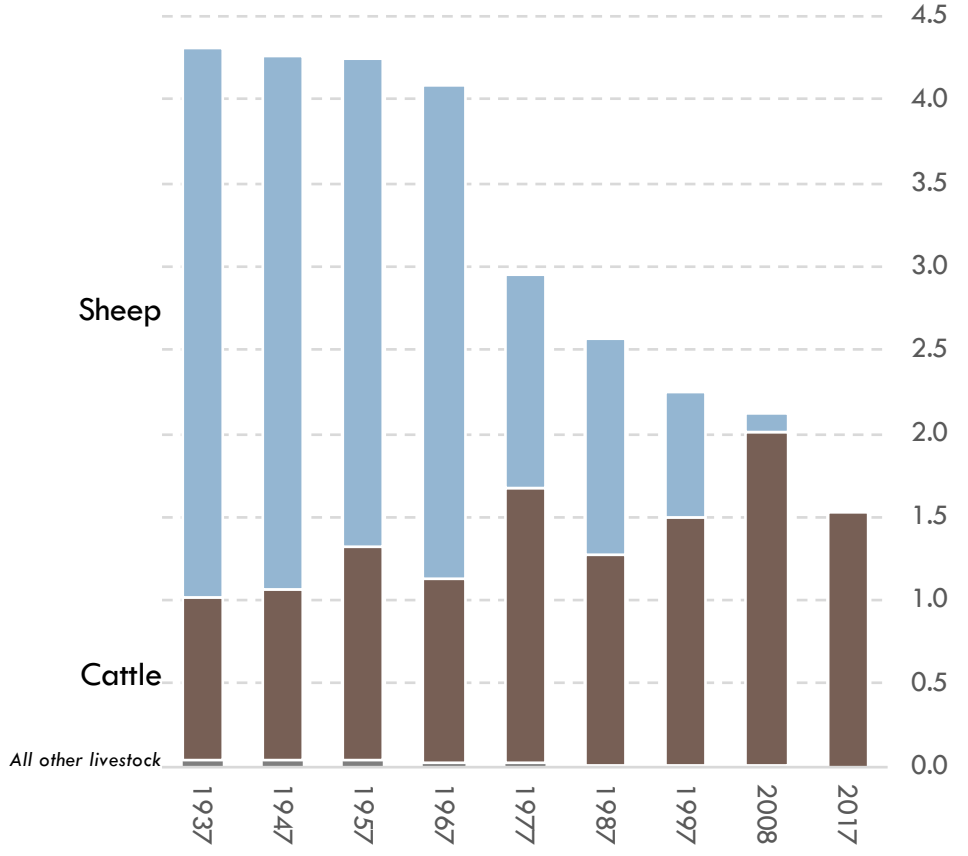
## NUMBER OF CATTLE IN REGION

*Head; m; point-in-time inventory; 1937-2017*




## # OF LIVESTOCK IN REGION

*Head; m; point-in-time inventory; 1937-2017*

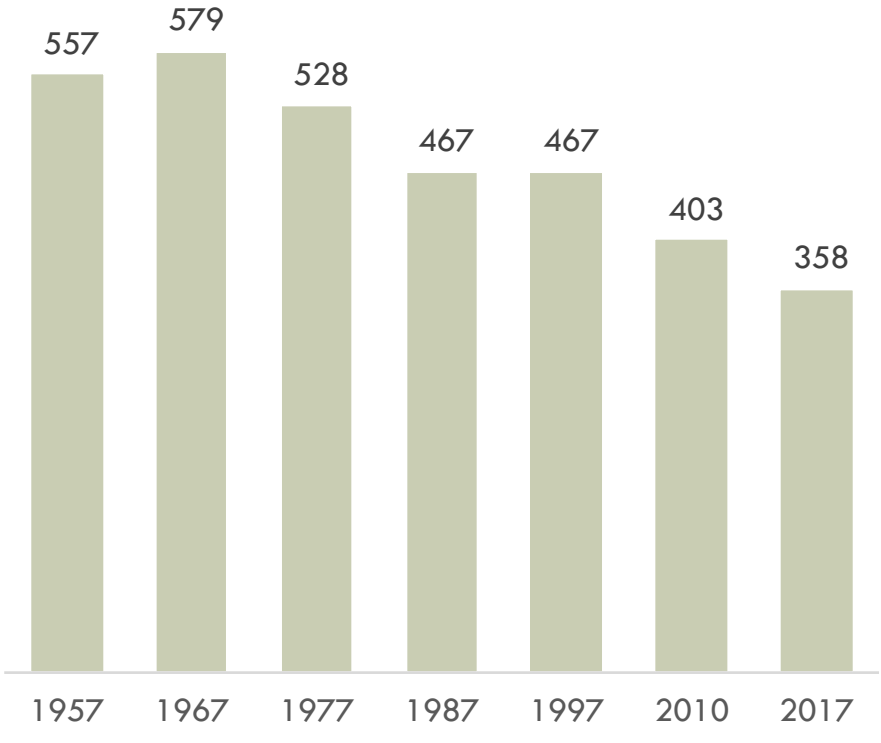



*CAGR = Compound Annual Growth Rate; Source: wide range of ABS (and predecessor organisation) publications; Coriolis modelling & analysis*

# *Regional pastoral or beef enterprises are improving efficiency and productivity through consolidation into fewer, larger farms*

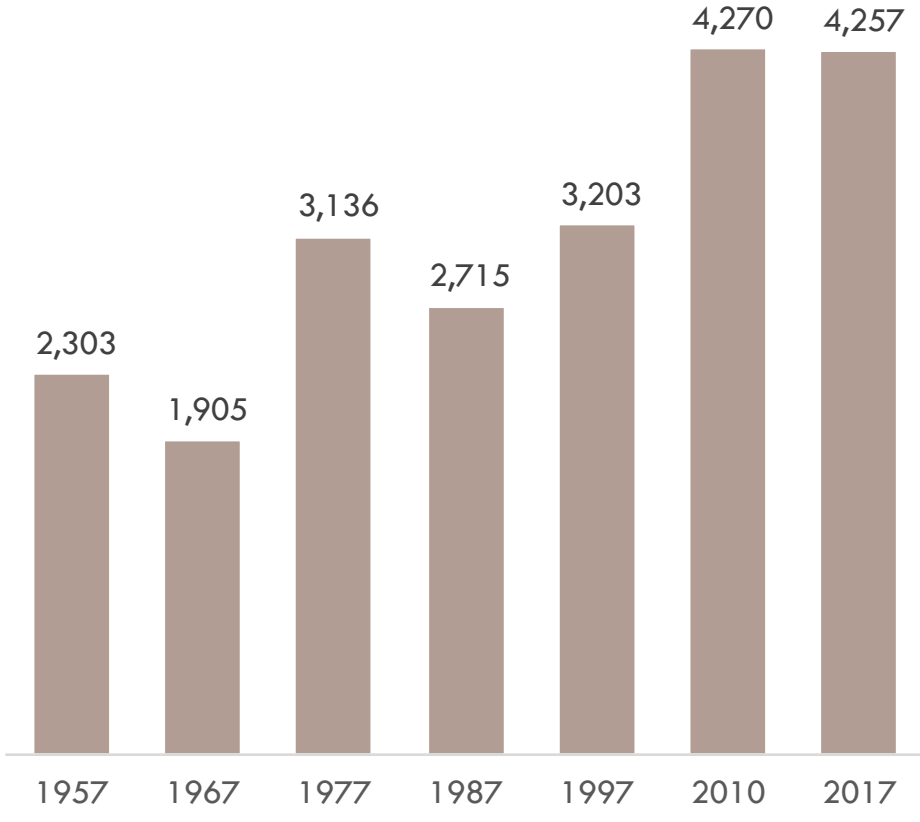
## NUMBER OF FARMS WITH CATTLE

*Units; 1957-2017*




## AVERAGE HEAD OF CATTLE/FARM

*Head/units; 1957-2017*

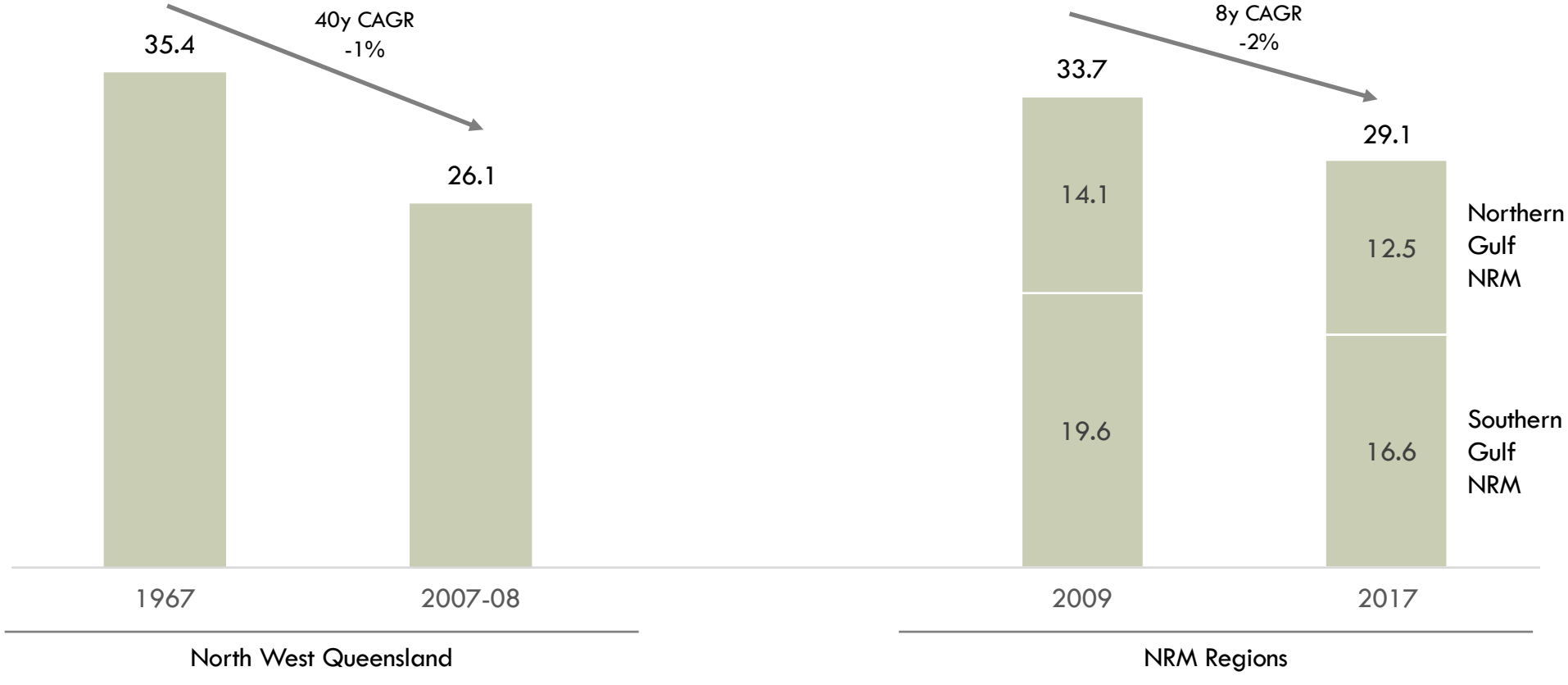



*Source: wide range of ABS (and predecessor organisation) publications; Coriolis modelling & analysis*

# *The total area of agricultural holdings in North West Queensland is declining*

## TOTAL AREA OF AGRICULTURAL HOLDINGS IN NORTH WEST QUEENSLAND REGION

*Hectares; m; 1967-2017*




*CAGR = Compound Annual Growth Rate; Source: wide range of ABS (and predecessor organisation) publications; Coriolis modelling & analysis*

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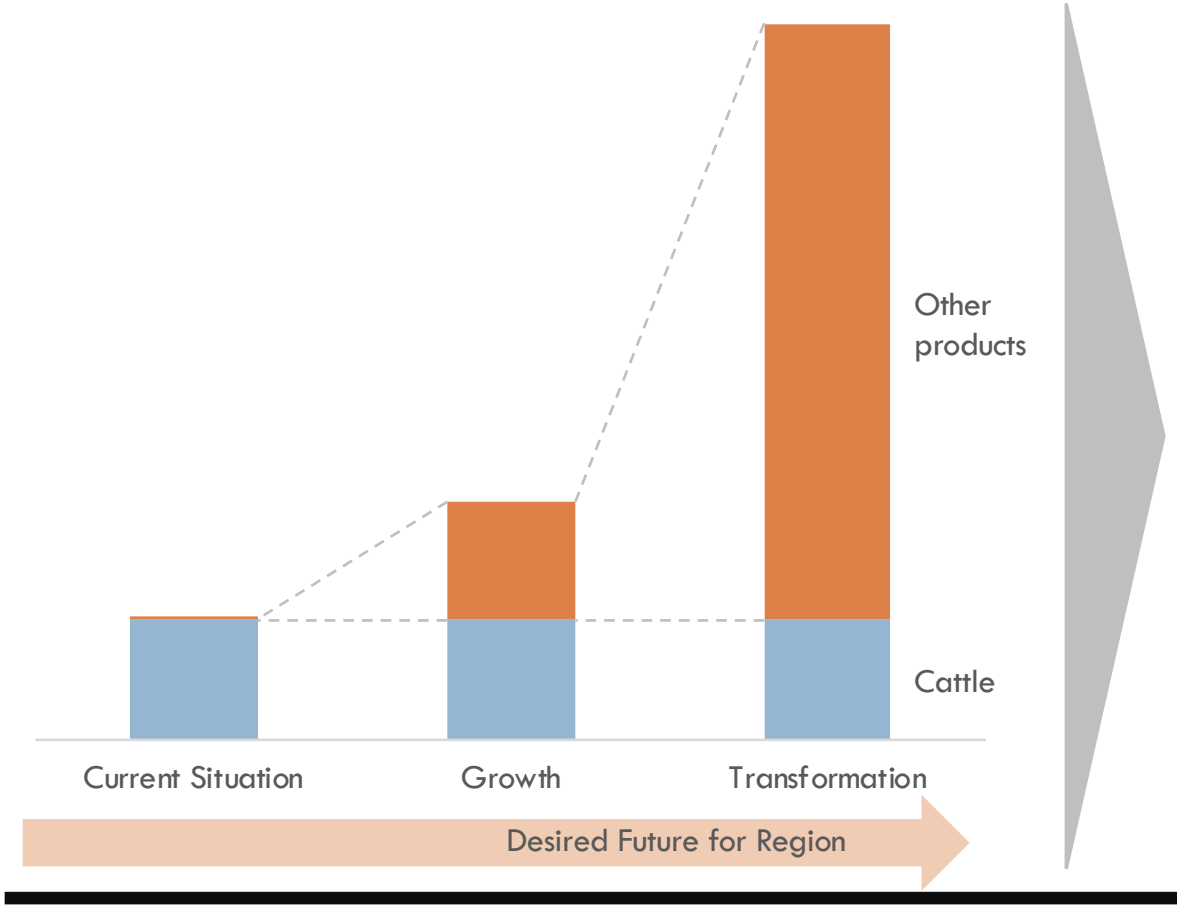
# *The region needs new ideas beyond cattle*




Leading to…

- Higher value per hectare
- Higher overall output
- Further processing in the region
- More diverse skills & capabilities
- Higher regional employment
- A vibrant regional economy
- People attracted to the region

# *However, the North is a harsh region where it is difficult to innovate*

"What we grew last year we can feed a few cattle this year and we will. But we are very wary about whether the price we receive for the cattle will cover the cost of the feeding… [The station] has shifted away from its original intentions to use the feedlot as a means of fattening cattle for slaughter… We're not against the concept, **but if you spend a few years doing something that's costing you more money than you're making, it just seems silly**. We're mainly using the feedlot facility and the farm to grow and store feed ready for the next drought… We're not really intending to try and fatten a lot of cattle. The expensive side of feedlotting is trying to put the fat on the cattle, and we think other people with grain feedlots can do that a lot better and cheaper than we can."

Michael Crisp, Station Manager, Lorraine Station, April 2017

"Doing things in the North isn't about maximising returns…

It's about **minimising risk.**"

Station owner

*Source: ABC Rural, 10 April 2017 article; Coriolis interview; Coriolis analysis*

# *Producing crops in the region is not a new idea; numerous products have been tried in the last 100 years*

## MAJOR/COMMERCIAL CROPS RECORDED AS PRODUCED IN NW QUEENSLAND

*Select; 1930's-2010's*

| 1930's | 1940's | 1950's | 1960's | 1970's |
|---|---|---|---|---|
| Maize | *No ag recorded* | Maize<br>Tomatoes<br>Tobacco | Cotton | Maize<br>Grain sorghum<br>Tomatoes |

| 1980's | 1990's | 2000's | 2010's |
|---|---|---|---|
| Maize<br>Pineapples<br>Potatoes<br>Bananas | Wheat<br>Grain sorghum | Wheat<br>Barley<br>Grain sorghum | Grain sorghum<br>Cotton<br>Safflower<br>Chickpeas<br>Mangos |

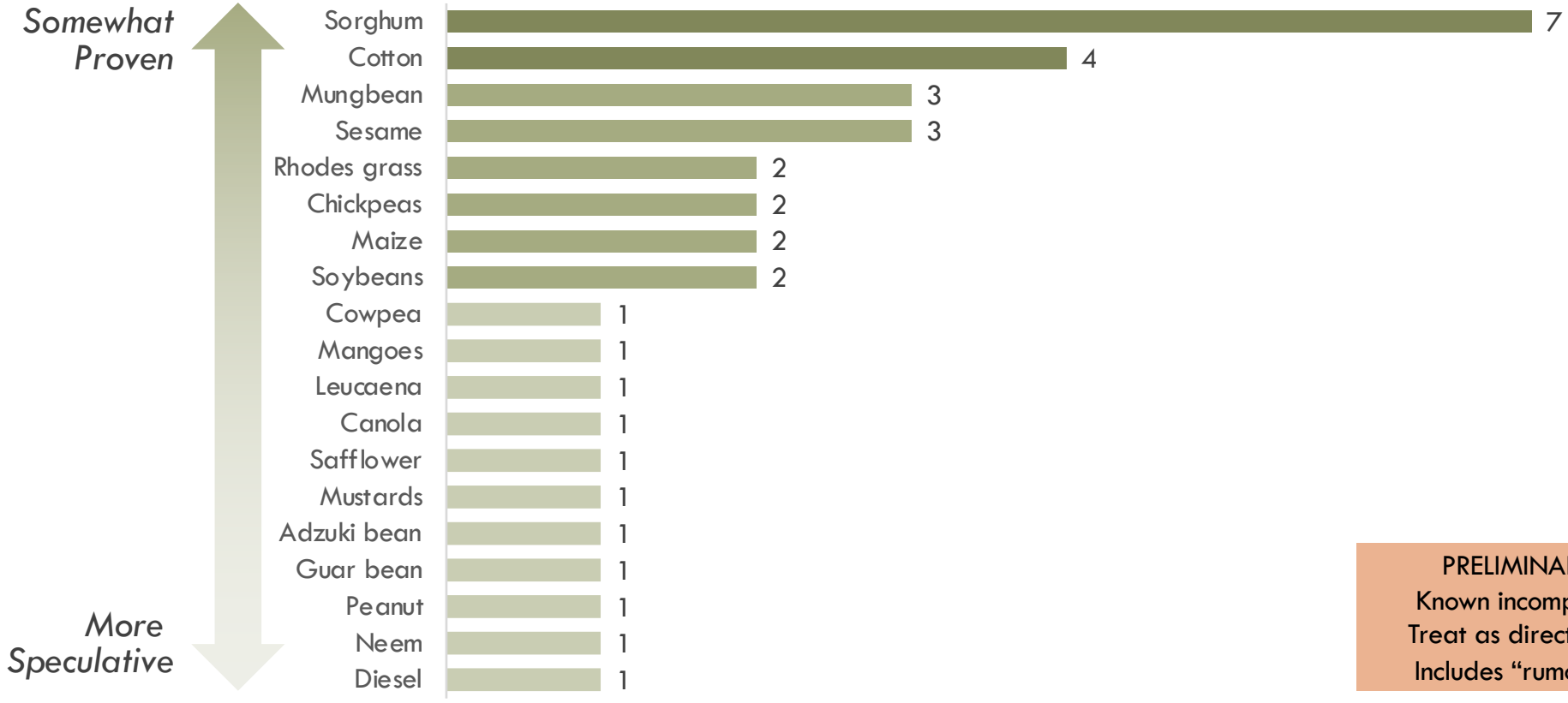
***If there was an easy solution, everyone would be doing it already***

*Note: Data excludes hay, silage and other on farm fodder; Source: wide range of ABS (and predecessor organisation) publications; Coriolis modelling & analysis*

# *A wide range of crops are currently being trialed or grown in the region across a range of locations*

## NUMBER OF KNOWN, RUMOURED OR TRIALED PRODUCTION SITES

*Separate farming operations; 2018 or recently*




PRELIMINARY
Known incomplete
Treat as directional
Includes "rumours"

*Source: see page prior (various published articles; interviews)*

# *Crops that are – or have been – produced in the region can be triaged into three types*

HORIZON 2

FEED/FODDER

*Primarily fed to cattle on farm or sold locally*

PROVEN CASH CROPS

*Will be produced where there is water and where it stacks up economically*

HORIZON 3

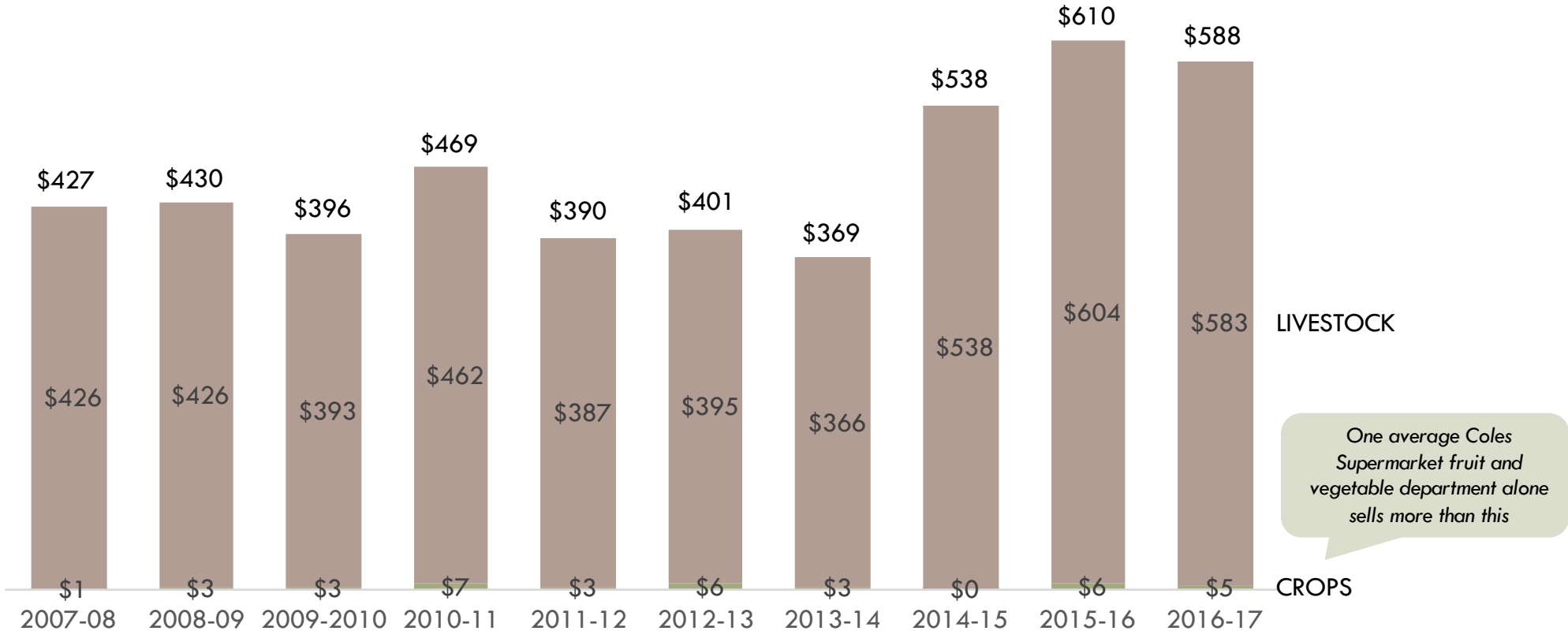
EXPERIMENTAL

*Need a viable, proven farming system, regional scale, a low cost supply chain and a market*

# *Unfortunately, diversification efforts in the region have failed to make much headway to date*

## GROSS VALUE OF AGRICULTURAL PRODUCTION SOUTHERN GULF

*A$; m; 2008-17; Southern Gulf NRM region*

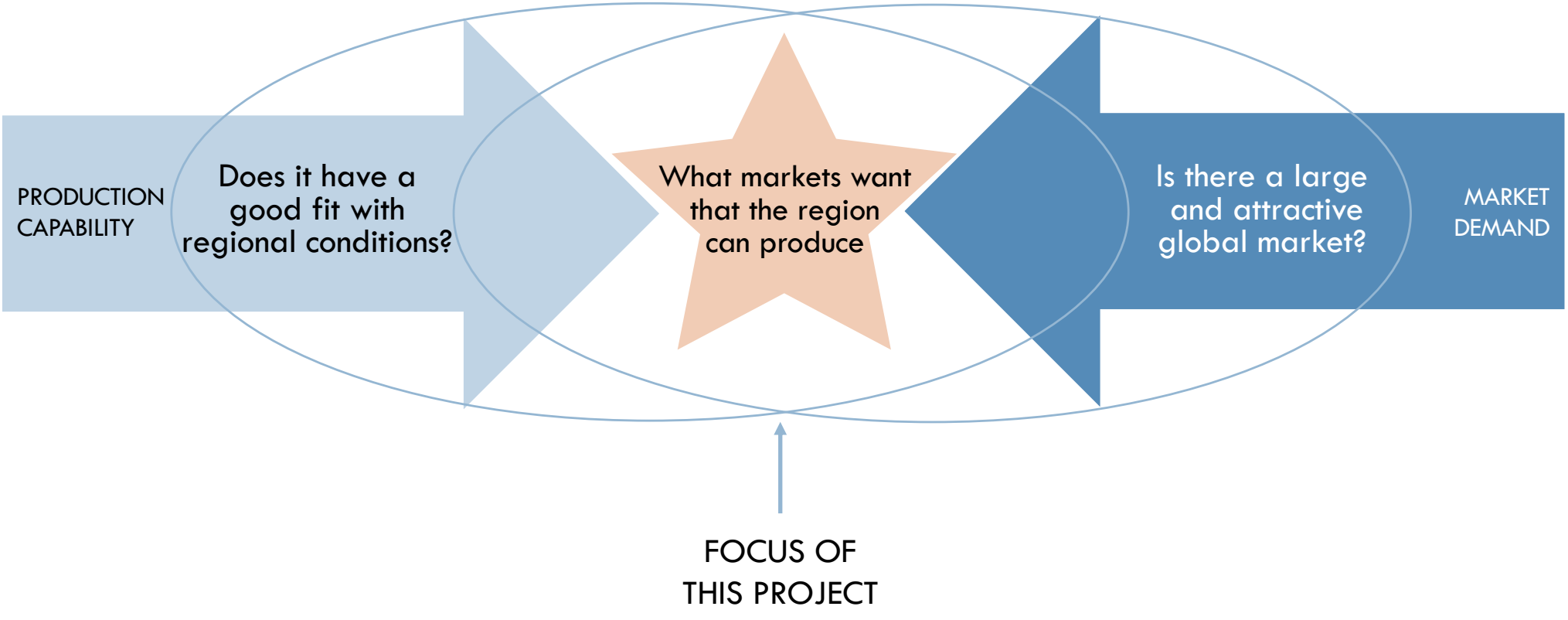



*NOTE: Southern Gulf NRM region only. Source: ABS; Coriolis analysis*

# *Increasing agricultural production in North West Queensland faces a range of key limitations or challenges*


*Source: Coriolis analysis*

# *Research sought high potential products that **both** (1) fit regional conditions **and** (2) had large and attractive global markets*



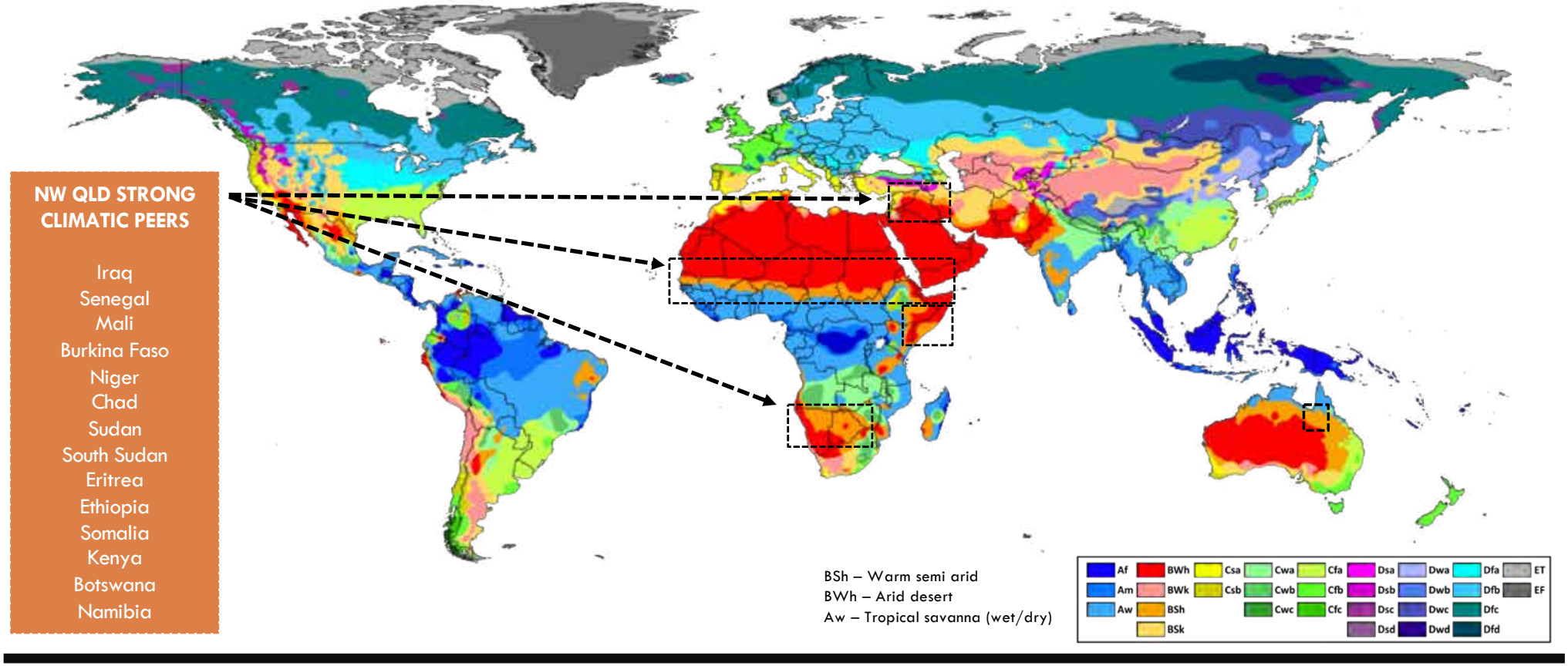

*SEE RELATED REPORT FOR DETAILED ANALYSIS*

*Source: Coriolis analysis*

# *Fourteen countries with a strongly similar climate to North West Queensland were identified as climatic peers*

## CLIMATIC ZONES OF THE WORLD – NW QLD CLIMATIC PEERS

*Koppen-Geiger Classification*

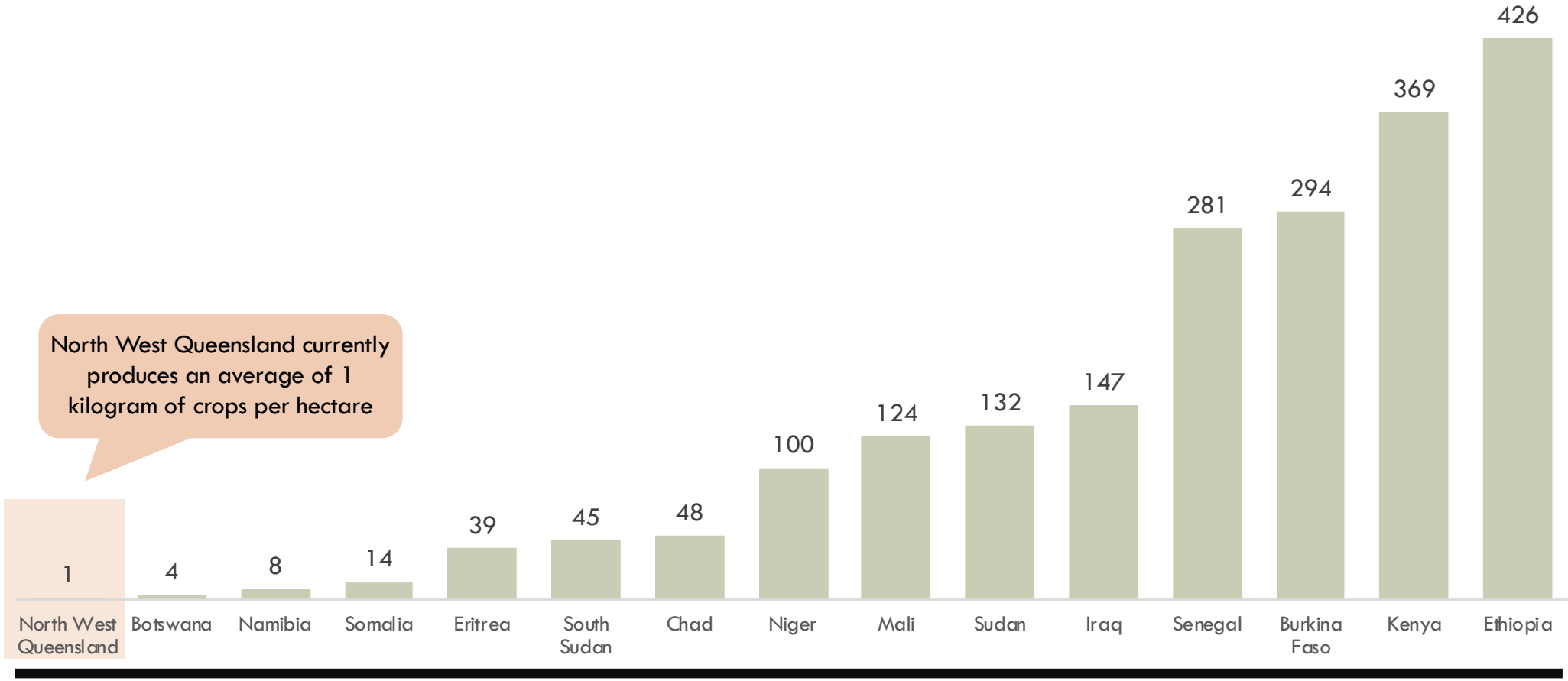



*Source: WikiCommons CC BY-SA 4.0 (By Peel, M. C., Finlayson, B. L., and McMahon, T. A.(University of Melbourne); Vectorized by Ali Zifan. - Hydrology and Earth System Sciences: "Updated world map of the Köppen-Geiger climate classification"; CC BY-SA 4.0); adapted by Coriolis; Coriolis analysis*

# *North West Queensland is not currently intensively farmed relative to climatic peers*

## TOTAL CROP PRODUCTIVITY/INTENSITY: NORTH WEST QUEENSLAND VS. PEERS

*Kilograms/ha; total land area; 2016 or 2016/17**

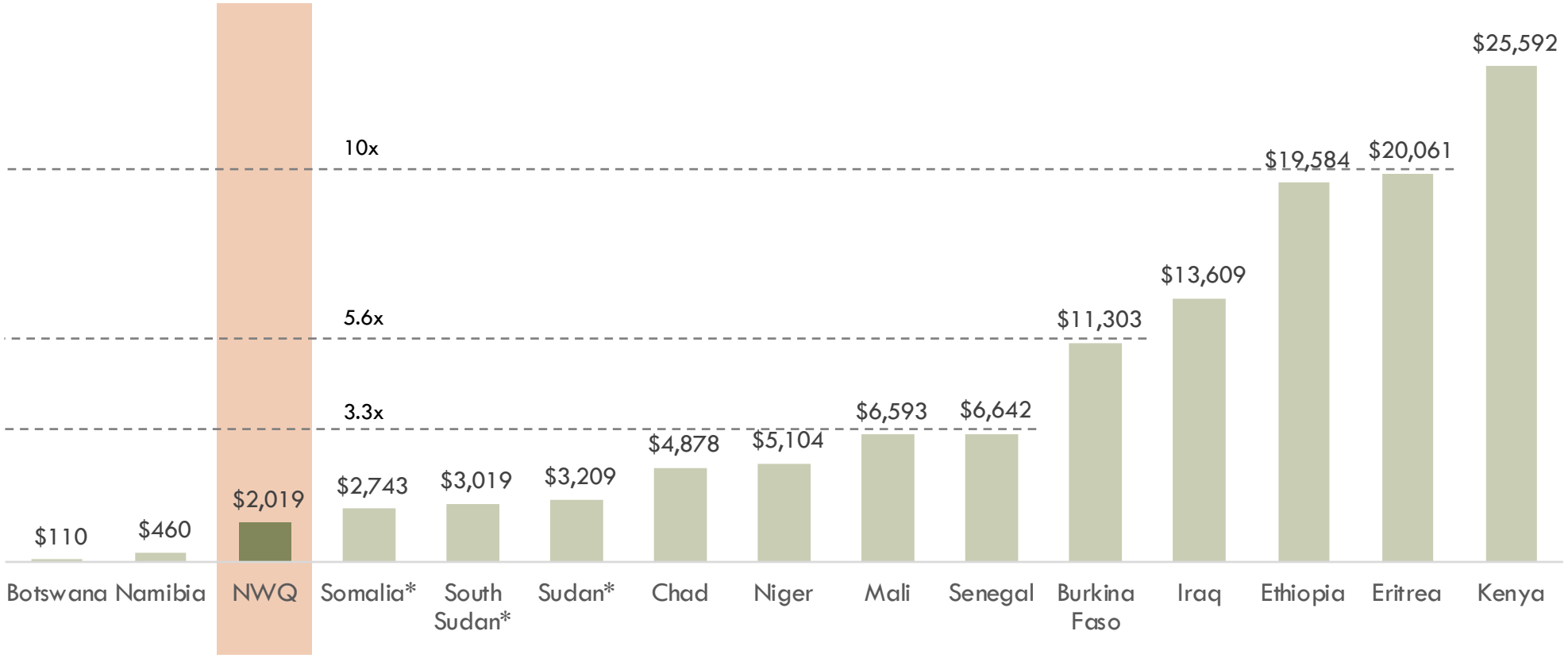



*Note: includes arable crops, root crops, vegetables, tree crops and fruit; * NWQ uses 2016/17. Source: World Bank; UN FAOSTAT; ABS; Coriolis estimates and analysis*

# *Strong climatic peers produce a lot more overall total (plant and animal) agricultural value per square kilometre*

## VALUE OF AGRICULTURAL PRODUCTION PER TOTAL SQUARE KILOMETRE

*US$/km²; all agriculture/total land area of country; 2015 or 2016/17^*




*^NWQ GVP 2016/17; *Uses International Currency; Source: World Bank; UNFAO; ABS; Coriolis estimates and analysis*

# *Climatic peers are achieving export success by producing a wider range of products for export; products that markets want to buy*

NORTH WEST QUEENSLAND


AFRICAN PEER GROUP REGIONS





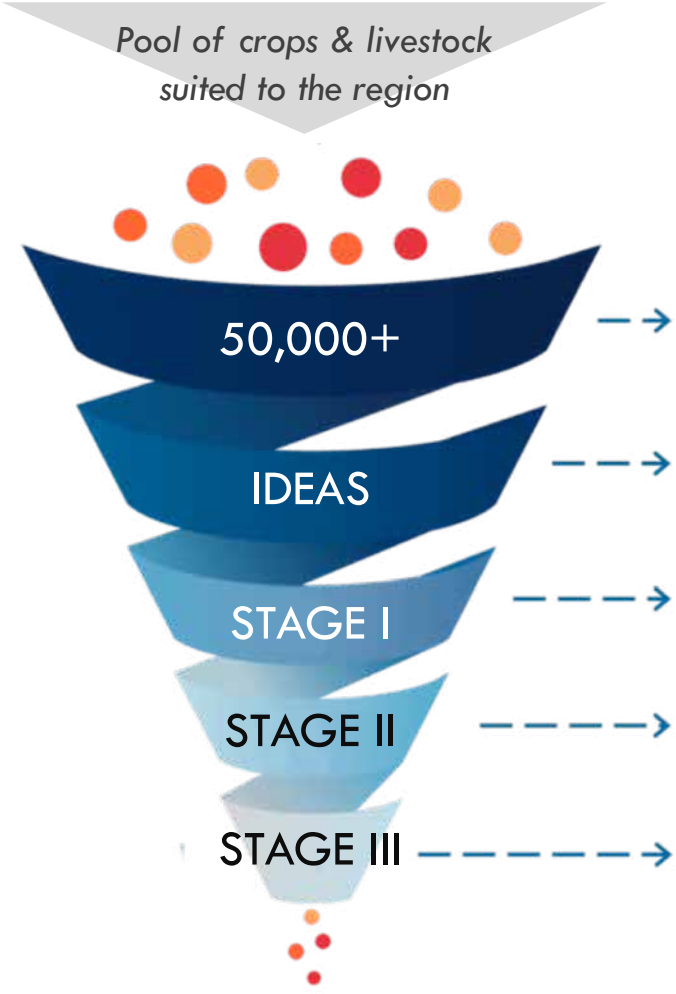





*Source: Coriolis analysis*

# *The project used a multi-stage screening process to identify products with high growth potential*

*Detailed later in document and appendices*




| | | |
|---|---|---|
| *Hypothetical Universe* | → | All plants and animals ever farmed by humans in some way |
| *From Stakeholders & Peers* | → | Products identified as potentially having merit in the region |
| *Existing or Potential* | → | Products compared across common set of metrics |
| *Twenty Opportunities* | → | High potential products with robust demand |
| *Potentially Transformative* | → | Products that could potentially transform agriculture in the region |

*Source: Coriolis analysis*

# One hundred new and emerging products were considered for the region

*SEE RELATED REPORT FOR DETAILED ANALYSIS*

## ANIMALS

### AQUACULTURE

Barramundi
Prawn
Redclaw Crayfish
Silver Perch

### MEAT

Buffalo Meat
Camel Meat
Emu Meat
Goatmeat
Kangaroo Meat
Ostrich Meat
Rabbit Meat
Wild Pig

### DAIRY

Buffalo Milk
Camel Milk
Goat Milk
Sheep Milk

### FIBRE/LEATHER

Alpaca Fibre
Crocodile
Goat Fibre

## BROADACRE/FIELD CROPS

### ANIMAL FEED

Amaranth
Bambatsi
Canary Grass
Grain Sorghum
Lablab
Leucaena
Lucerne
Maize

### INDUSTRIAL

Blue Agave
Castor
Cotton
Flaxseed
Guar
Hemp
Jute
Kenaf
Mustard
Safflower
Stevia
Sugarcane
Sunn Hemp
Triodia ("Spinifex")

### FOOD

Bambara
Canola
Chia
Chickpea
Coriander
Fenugreek
Fonio
Lentil
Mate
Mungbean
Native Rice
Peanut
Pearl Millet
Peppercorn
Quinoa
Rice
Sesame
Soybean
Sunflower
Teff

## HORTICULTURE

Bitter Melon
Cassava
Chilli
Cucumber
Horned Melon
Melon
Okra
Onion
Pumpkin/Squash
Snake Bean
Sweet Corn
Sweet Potato
Taro
Yam

## TREE CROPS

### NUTS

Cashew
Coconut
Jojoba
Pistachio
Shea
Tung

### FRUIT

Baobab
Custard Apple
Date
Desert Date
Jackfruit
Lemon/Lime
Mango
Marula
Pitaya
Pomegranate
Table Grape
Tamarind

### NATIVE FOODS

Native Foods
*(Desert limes, Davidson plum, Kakadu plum, wattleseed, caperbush, wild orange, wild passionfruit, conkerberry, ruby saltbush, desert fig, doubah, emu apple, quandong, bush tomato, parakeelya, bush potato, pencil yam, peppercresses, large pigweed, mulga seeds, dogwood seeds, witchetty bush seeds)*

### PLANTATION

African Mahogany
Eucalyptus Oil
Indian Sandalwood
Oil Palm
Pongamia
Mallee

*Source: Coriolis analysis*

## *Twenty specific opportunities emerged in Stage II of this process*




















# *AGENDA*

WHY ARE WE HERE?

WHAT PROBLEM ARE WE TRYING TO SOLVE? WHY AGRICULTURE?

WHAT DO WE HAVE TO WORK WITH?

HOW DO WE FIND NEW IDEAS BEYOND CATTLE?

WHAT IS THE SOLUTION?

HOW DO WE IMPLEMENT?

# *North West Queensland has three horizons for agricultural growth*

## THREE HORIZONS OF GROWTH FRAMEWORK: NORTH WEST QUEENSLAND

*Model; 2017*

### HORIZON 1

Grow & build cattle

### HORIZON 2

Support emerging projects & products

### HORIZON 3

Discover & develop new options

*Source: Coriolis analysis*

# *Horizon 1 for North West Queensland agriculture is growing and building on the region's cattle operations*

## THREE HORIZONS OF GROWTH FRAMEWORK: NORTH WEST QUEENSLAND

*Model; 2017*

### HORIZON 1

Grow & build cattle


### HORIZON 2

*Support emerging projects & products*

### HORIZON 3

*Discover & develop new options*

*Source: Coriolis analysis*

# *Horizon 2 for North West Queensland agriculture will be enabled by investment in irrigation infrastructure*

## THREE HORIZONS OF GROWTH FRAMEWORK: NORTH WEST QUEENSLAND

*Model; 2017*

### HORIZON 1

*Grow & build cattle*

### HORIZON 2

Support emerging projects & products


### HORIZON 3

*Discover & develop new options*

# *There are significant amounts of water in the region available for agricultural development*

## SURFACE WATER GENERAL UNALLOCATED VOLUMES AND RELEASES

*ML; Water Plan (Gulf) region; 2018*

| | TOTAL VOLUMES OF "GENERAL UNALLOCATED WATER" (ML) AS OF SEPT 2017* | EXISTING IRRIGATION PRIOR TO 2012 (ML) | GENERAL UNALLOCATED WATER RELEASES SINCE 2012 (ML) | | |
|---|---|---|---|---|---|
| | | | GRANTED JULY 2012 | GRANTED NOV 2015 | GRANTED AUG 2017 |
| Flinders River Catchment | 239,650 | 17,280 | 80,000 | 92,500 | 7,500 |
| Gilbert River Catchment | 467,000 | 9,115 | 14,200 | | Process ongoing |
| Other Catchments | 24,900 | | | 7,500 | |
| Gulf Total | 731,550 | | 94,200 | 100,000 | Process ongoing |

*PRELIMINARY*
*Review of secondary sources out of scope*

**Current as at 2 September 2017. Source: DNRM Water Resource (Gulf) Plan 2007 Sale of unallocated water: tender assessment report 2013 & 2017; Water Plan (Gulf) 2007; CSIRO; Coriolis analysis*

# *Major proposed water projects in the region could unlock 115,000ha of productive farmland and enable strong growth*

## MAJOR PROPOSED WATER PROJECTS IN VARIOUS STAGES OF DEVELOPMENT

*As of late 2018*

| PROJECT NAME | PROPOSED WATER SUPPLY | PROPOSED AREA IRRIGATED |
|---|---|---|
| Gilbert River Irrigation Scheme | 200,000 ML | 20,000 ha |
| 3 Rivers Irrigation Project | 150,000 ML | 15,000 ha |
| Richmond Agricultural Project | 100,000 ML | 11,000 ha |
| North West Queensland Water Storage (Cave Hill Dam) | 248,000ML | 4,000-12,000ha |
| Dismal Creek Depression (Strathmore Station) | 350,000 ML | 35,000 ha |
| Other (Smaller, enterprise driven projects) | | ~25,000 ha |
| TOTAL | 1,048,000 ML | ~115,000 ha |

PRELIMINARY
Review of secondary sources out of scope

*Source: various websites; Coriolis interviews; Coriolis analysis*

# *As an example of other, smaller developments in progress, Etta Plains has 19,500 ha of potential crop land and available water*

## EXAMPLE: ETTA PLAINS CROPPING INVESTMENT OPPORTUNITY

*Latest available*

**AJM Pastoral**
**Property 28,442ha** (120km North Julia Creek)

- 19,500ha potential cropping land
  - 9,500ha identified for irrigation agricultural development
  - 10,000ha dryland cropping

- 39,500ML water allocation from the Flinders River

- Gravity feed irrigation, sloping land suitable for irrigation
- Opportunity for irrigation and dryland
- No clearing required (Downs Country)
- Black soil, self-cracking

- Options for sale, long term lease, JV

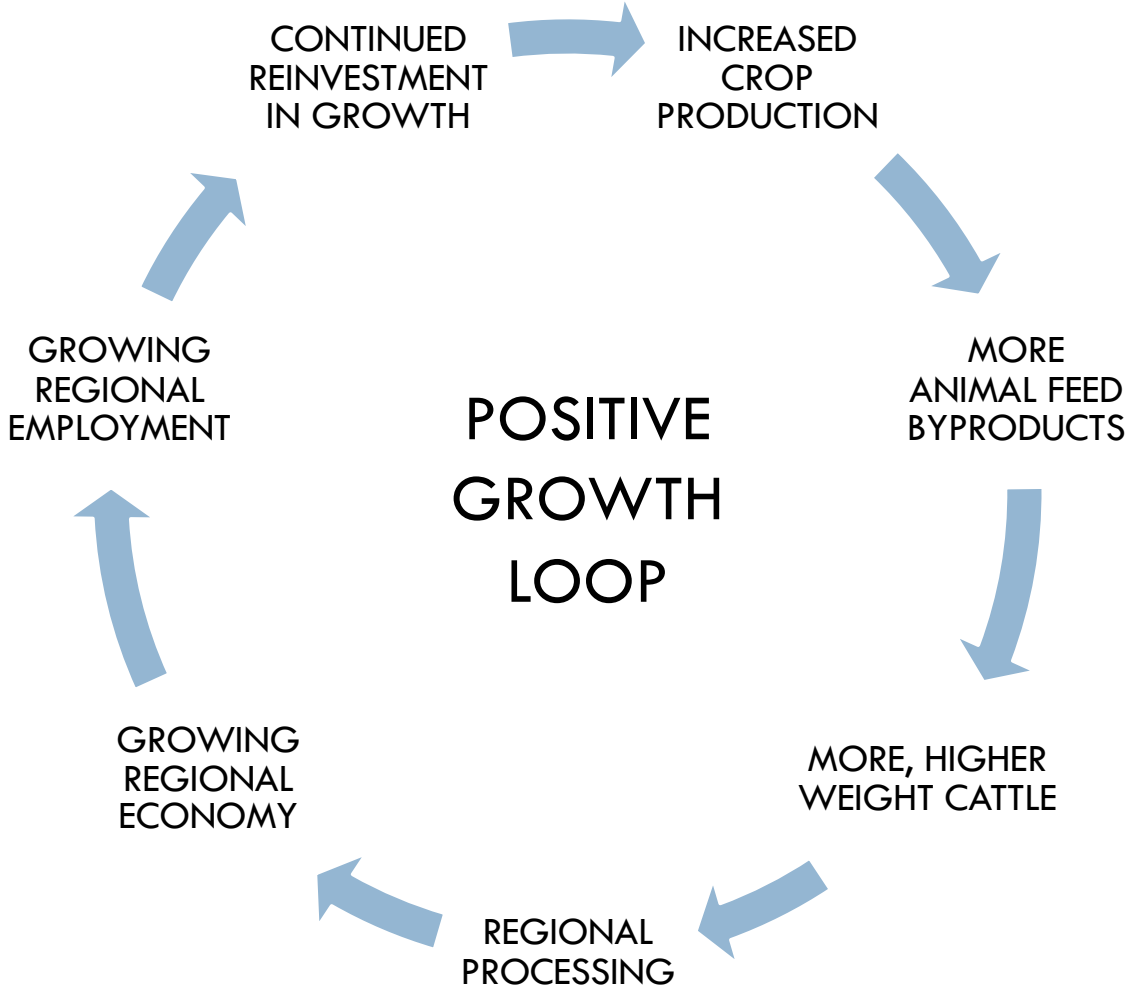
- Grazing Homestead Perpetual Lease (GHPL) in conversion to Freehold on (Lot 1 on CE3, Lot2 on MF18)

## EXAMPLE CROPPING OPPORTUNITIES*

| CROP | YIELD (T/HA) | PRICE (A$/tonne); 2013 | WATER USE (ML/HA) |
|---|---|---|---|
| Sorghum (grain) | 7-9 | 220-280/t | 3.5 |
| Cotton | 7-9 bales | 440/bale | 8-10 |
| Mung bean | 2.5-3 | 900/t | 6-8 |
| Sorghum (fodder) | n/a | n/a | 2-4 |
| Chickpea | 2.5-3 | 450/t | 3 |

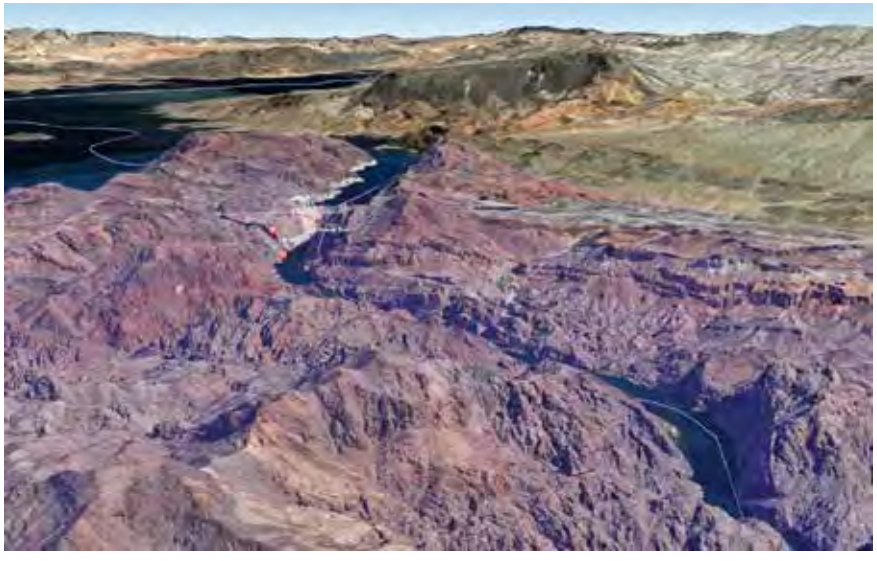
*Source: Coriolis interview, *AJM Pastoral promotional material*

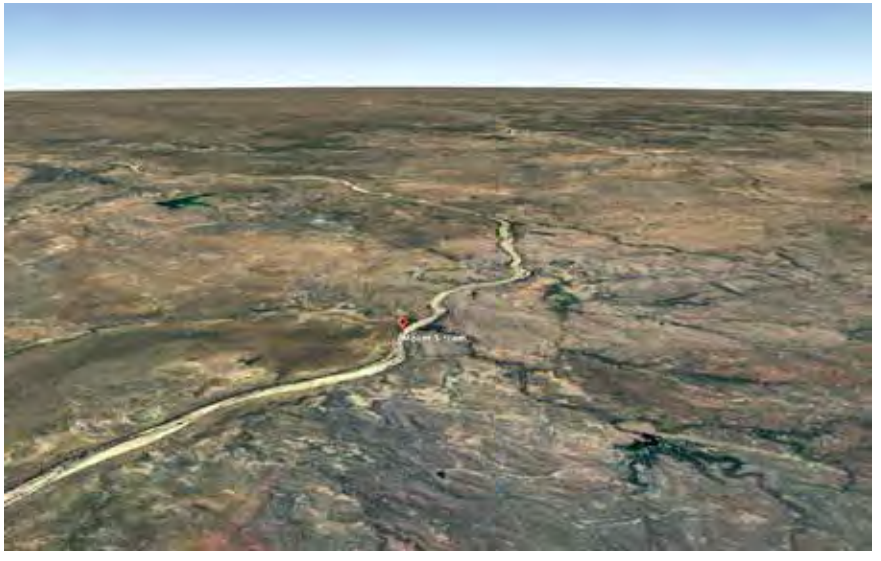
# *Increased irrigation enables strong synergies and creates a positive growth loop for the region*




*Source: Coriolis analysis*

# *Economically, large scale irrigation projects are challenged by the region being flat, with high evapouration and high costs**





HOOVER DAM
(1936)
39,200,000 megalitres
221m high / 379m length

~200x

GILBERT RIVER IRRIGATION PROJECT
(proposed)
200,000 megalitres

US$49m (US$510m/A$720m today)

~3x

A$220-360m (capital cost estimates)

** and have a large surface area for evaporation (relative to total volume). Source: various published articles; Coriolis analysis*

# *Research highlights seven products as opportunities for North West Queensland in Horizon 2*

## HORIZON 2 – CAN BE IRRIGATED OR GROWN DRYLAND





## HORIZON 2 – ANIMALS


## HORIZON 2 – WATER INTENSIVE CROPS




*Source: Coriolis analysis*

# *Horizon 3 for North West Queensland agriculture is new products not traditionally grown in the region and outside "comfort zone"*

## THREE HORIZONS OF GROWTH FRAMEWORK: NORTH WEST QUEENSLAND

*Model; 2017*

### HORIZON 1

*Grow & build cattle*

### HORIZON 2

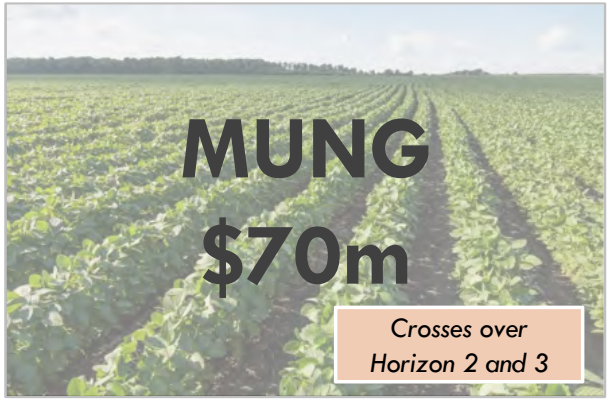
*Support emerging projects & products*

### HORIZON 3

Discover & develop new options

# *Six new Horizon 3 products with high potential for growth were identified for North West Queensland*

*IDENTIFIED POTENTIALLY TRANSFORMATIVE HORIZON 3 OPPORTUNITIES*

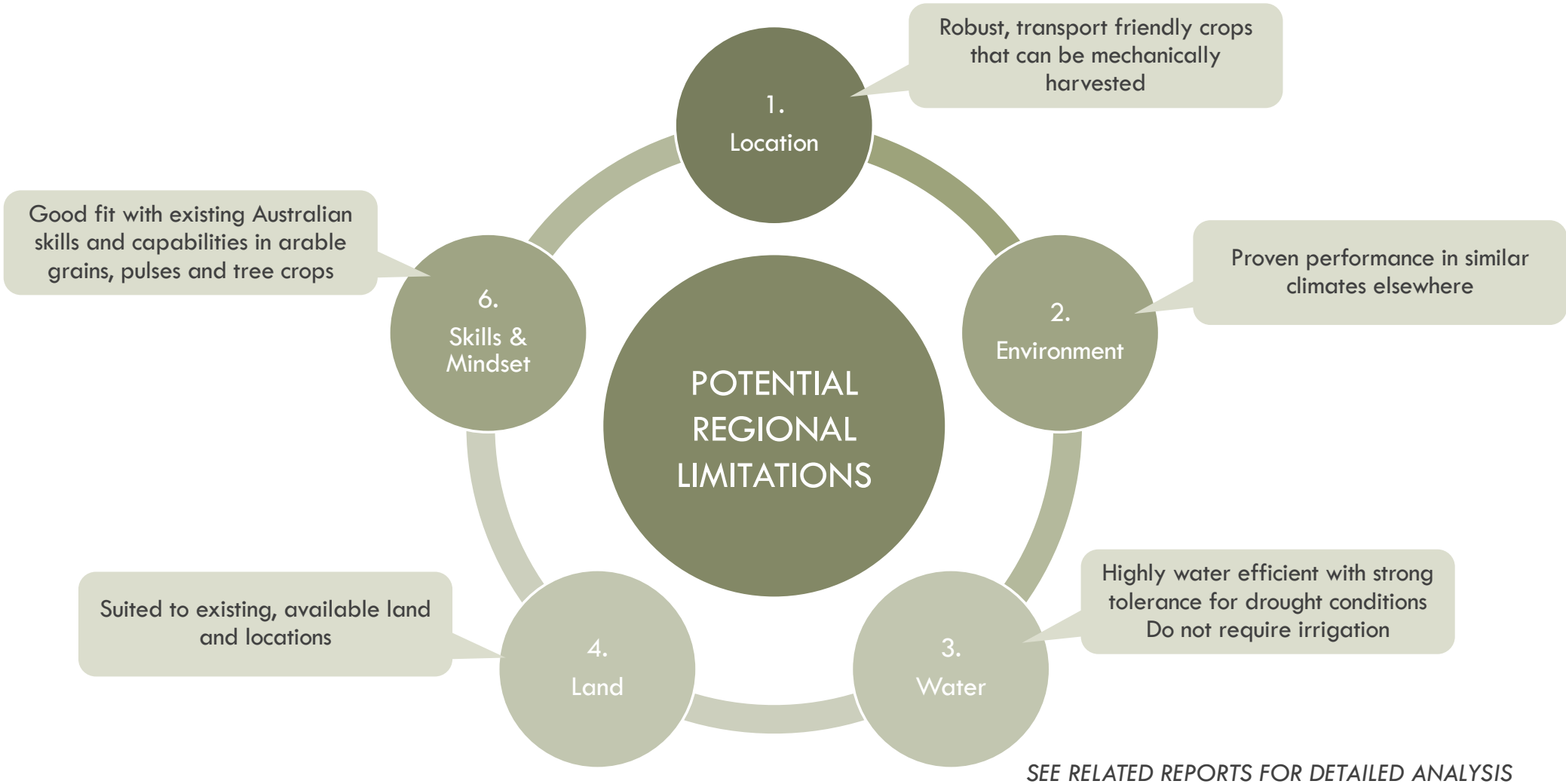


*SEE RELATED REPORTS FOR DETAILED ANALYSIS*




*Source: Coriolis analysis*

# *The identified Horizon 3 crops can progress rapidly as they overcome regional limitations*




*SEE RELATED REPORTS FOR DETAILED ANALYSIS*

*Source: Coriolis analysis*

# *Progress is not linear; the three horizons support each other and build on growth*


GROWTH

Fodder
Animal Feed


GROWTH

Fodder
Animal Feed


GROWTH

# *AGENDA*

WHY ARE WE HERE?

WHAT PROBLEM ARE WE TRYING TO SOLVE? WHY AGRICULTURE?

WHAT DO WE HAVE TO WORK WITH?

HOW DO WE FIND NEW IDEAS BEYOND CATTLE?

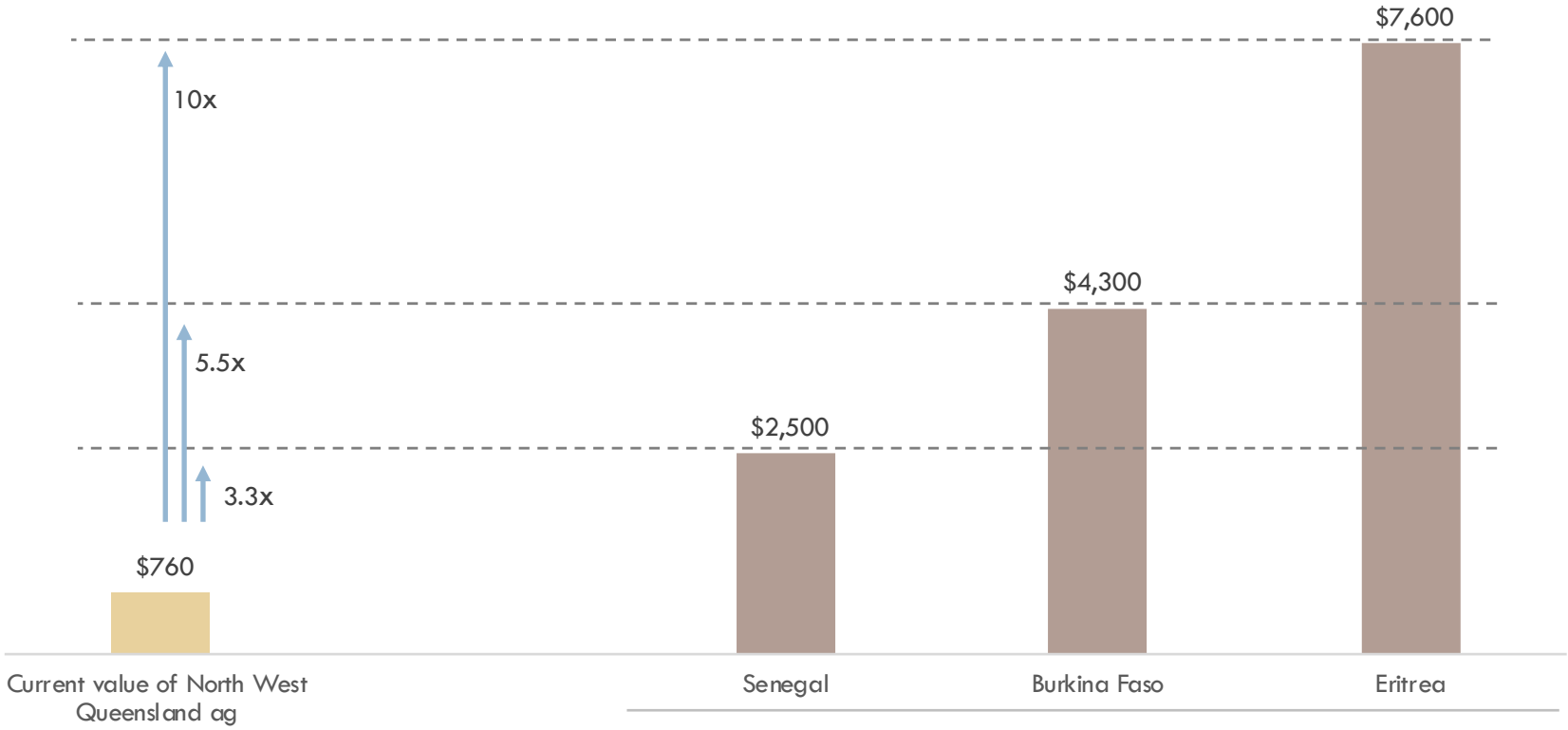
WHAT IS THE SOLUTION?

HOW DO WE IMPLEMENT?

# *North West Queensland should aspire to match the performance of African climatic peers*

## NORTH WEST QUEENSLAND POTENTIAL VALUE OF AGRICULTURAL PRODUCTION

*A$; m; nominal 2017*




*How much would we produce if we could match the performance of this country? (A$; m)*

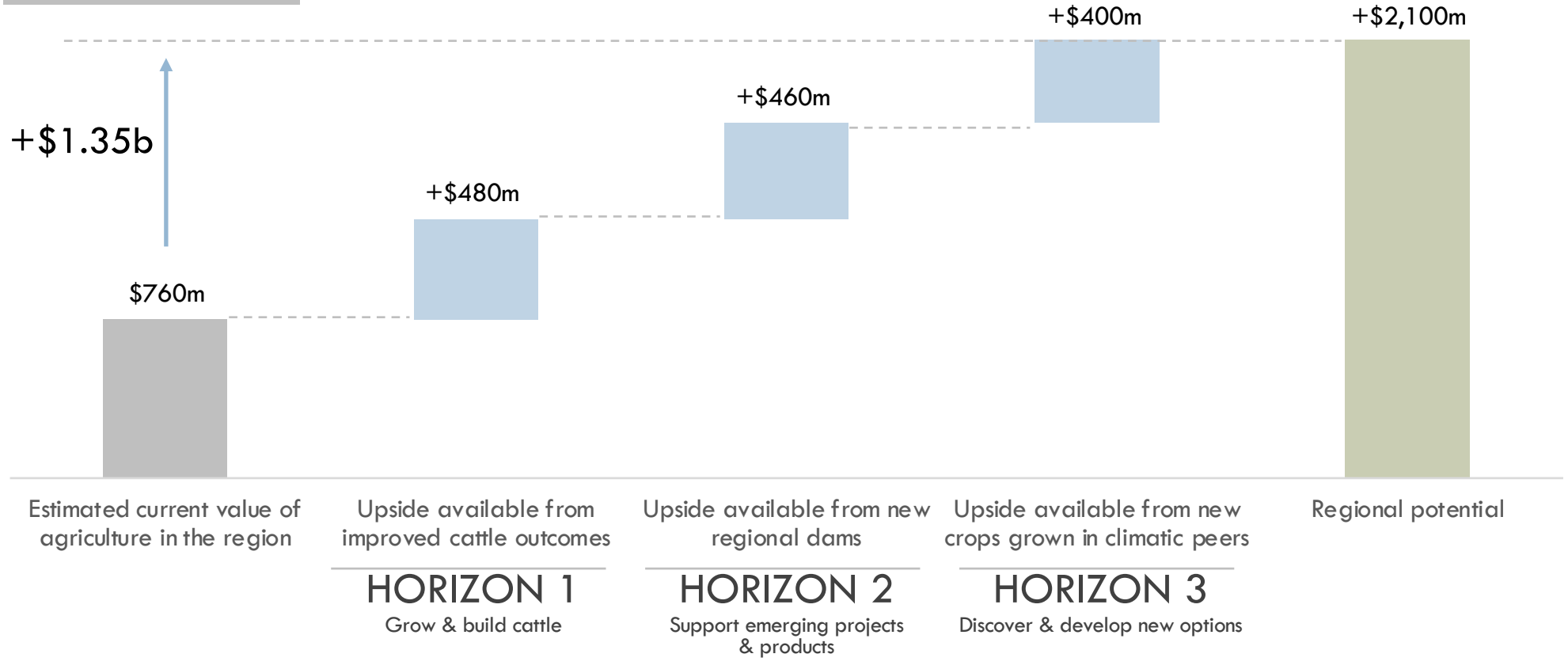
*Source: UN FAOSTAT; ABS; Coriolis estimates and analysis*

# *With investment, North West Queensland can create $1.35b in new agricultural growth across these three horizons*

## GROWTH BRIDGE: POTENTIAL UPSIDE FROM THREE GROWTH HORIZONS

*A$; m; nominal 2017*

*INDICATIVE/DIRECTIONAL*



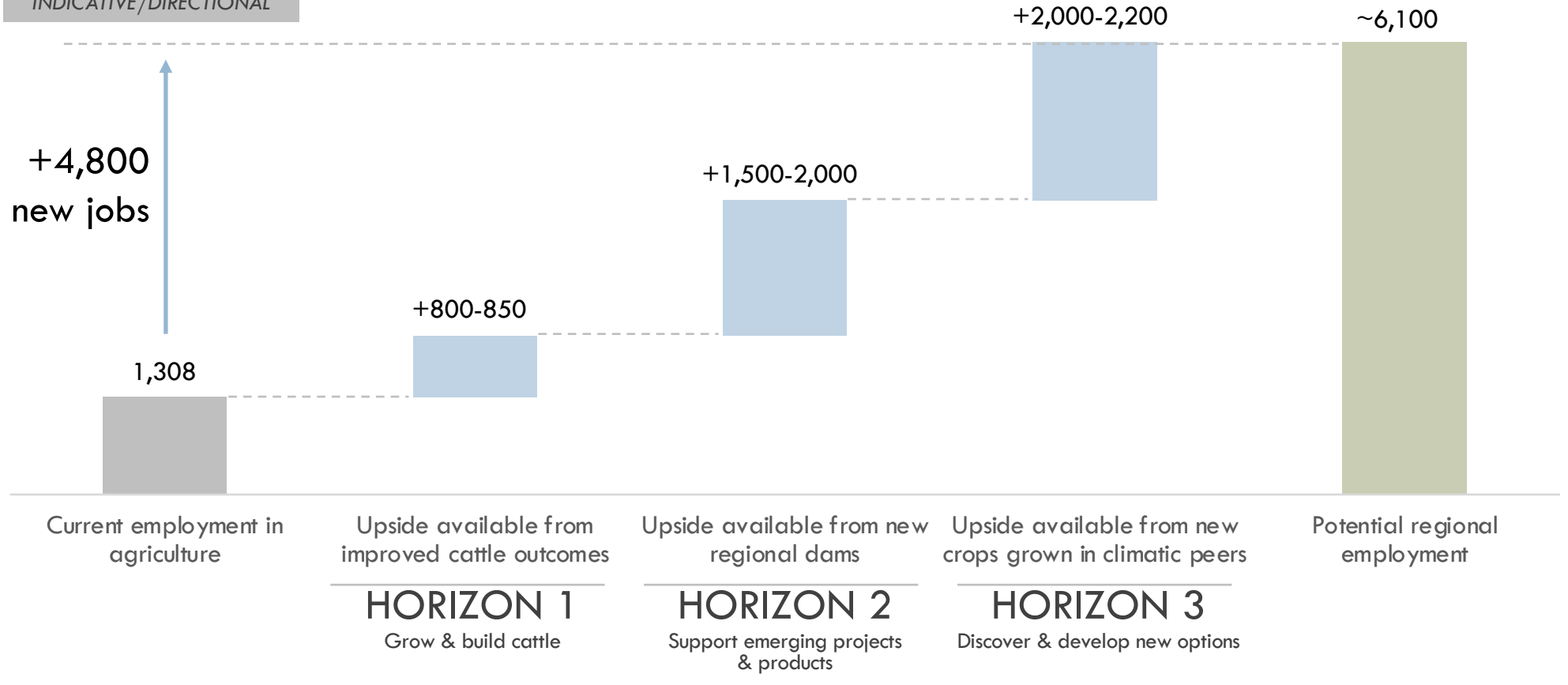

*Source: ABS (7121.0; 7503.0); MLA; UN FAO; UN Comtrade; other Coriolis research; Coriolis estimates, analysis and modelling*

# *Creating this level of agricultural growth in North West Queensland could create up to 4,800 new jobs*

## GROWTH BRIDGE: POTENTIAL UPSIDE FROM THREE GROWTH HORIZONS

*A$; m; nominal 2017*

*INDICATIVE/DIRECTIONAL*




*Source: ABS (7121.0; 7503.0; 6291.0); MLA; HIA; Cotton Australia; UN FAO; UN Comtrade; other Coriolis research; Coriolis estimates, analysis and modelling*

# *Significant investment of time and resources is required to realise the opportunity in North West Queensland*

## HORIZON 1
Grow & build cattle


## HORIZON 2
Support emerging products


## HORIZON 3
Discover & develop new options


*Primarily existing/ongoing funding*

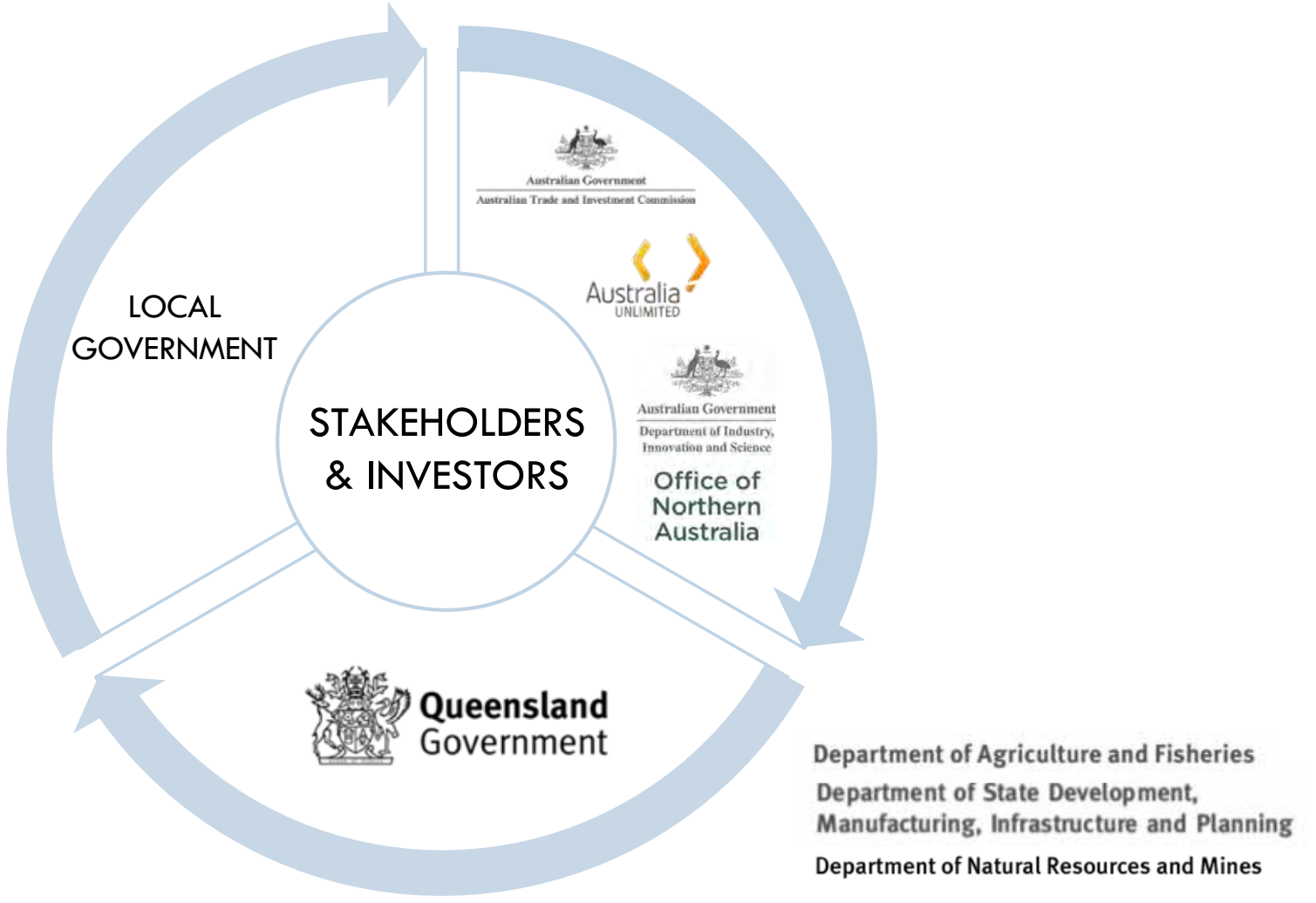
*Required new funding*

*Source: Coriolis analysis*

# *Stakeholder, investors and all levels of government need to work collaboratively to realise the opportunity and create change*

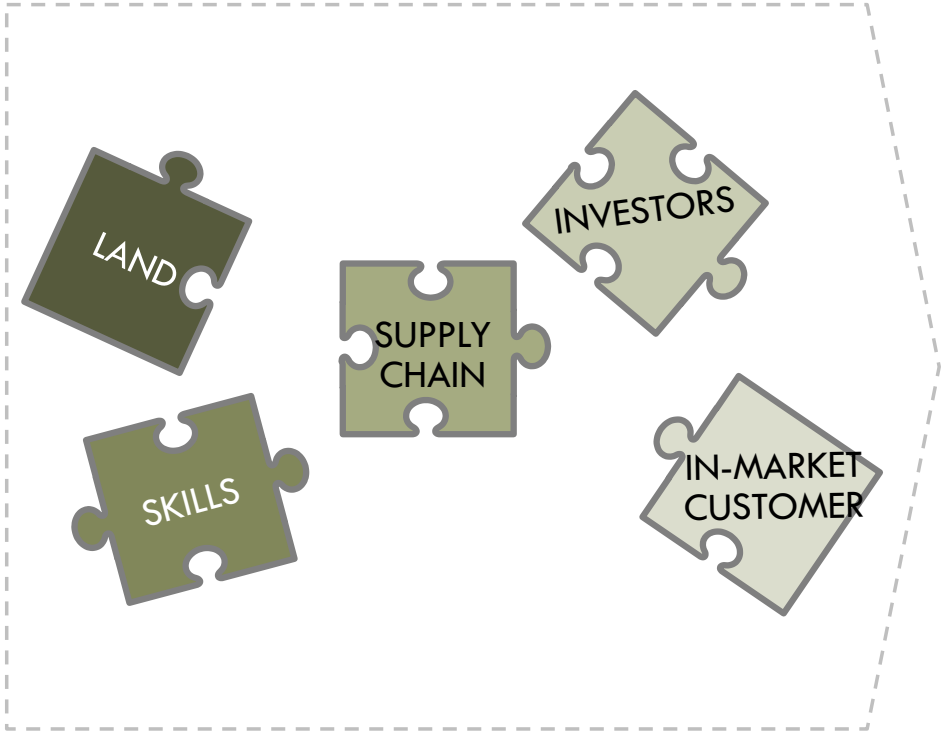
KEY STAKEHOLDERS

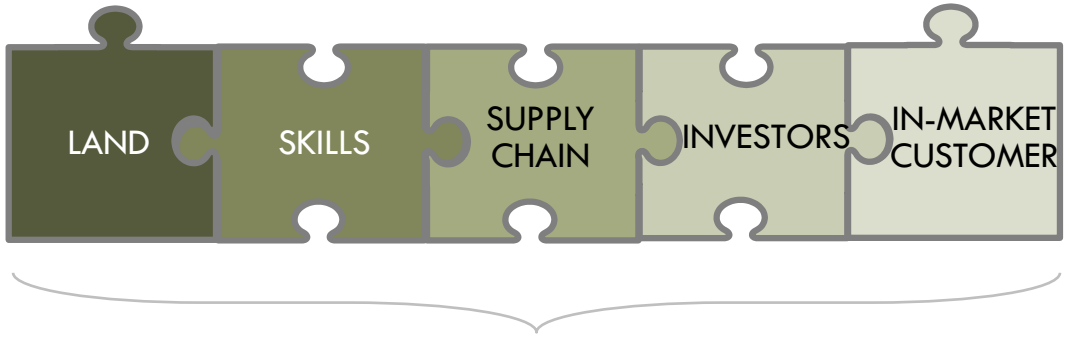
*Model; 2018*




*Source: Coriolis analysis*

# *A focused implementation team is needed to bring together the critical "pieces of the puzzle" required to deliver on the plan*



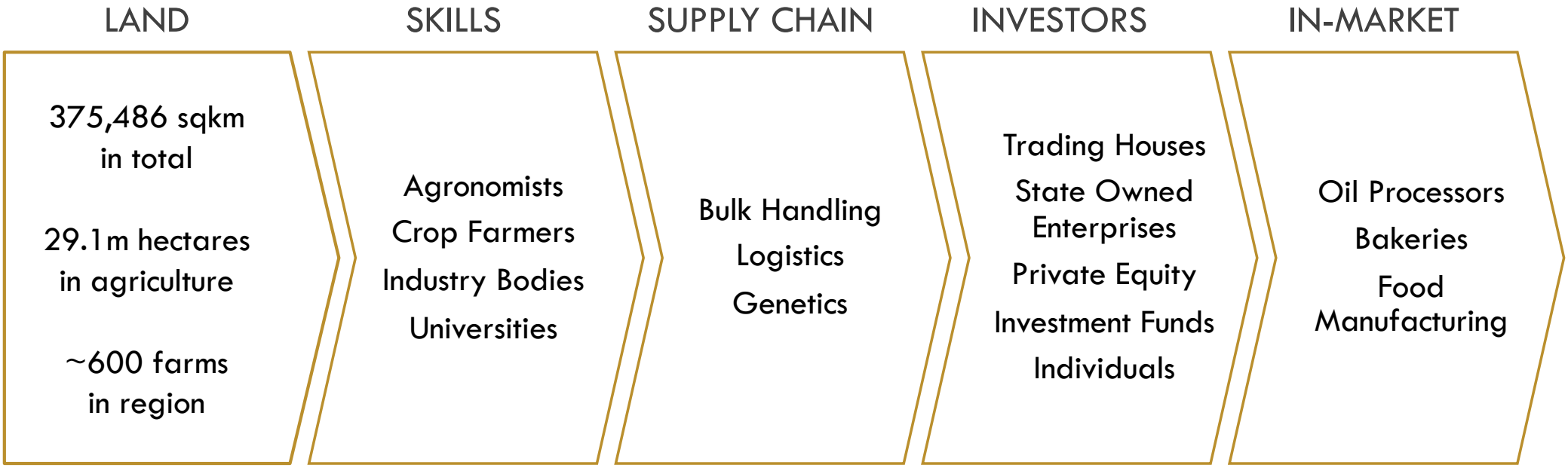

*CLEAR NEED FOR AN IMPLEMENTATION TEAM TO PLAY A ROLE*

*Source: Coriolis analysis*

# *As an example, realising the North West Queensland sesame opportunity requires multiple pieces to come together*

## EXAMPLE: "PIECES OF THE PUZZLE" REQUIRED TO REALISE THE SESAME OPPORTUNITY

*Model; 2018*




*Source: Coriolis analysis*

# *The team needs to deliver on (1) development coordination, (2) opportunity development and (3) opportunity promotion*

SUPPORT DEVELOPMENT

ATTRACT INVESTMENT




- Opportunity Prioritisation
- Project Management
- Resource Alignment

- Opportunity Work-up
- Required R&D
- Location Identification
- Supply Chain Optimisation
- Identifying Gaps, etc.

- Investment Identification
- Introduce Partners
- Develop & Deliver Messaging
- Investment Promotion

*Source: Coriolis analysis*

# *This focused team will require an investment by government of between $8m to $10m over four years to deliver growth*

## GOVERNMENT INVESTMENT IS REQUIRED IN TEAM DIRECTLY TO FACILITATE GROWTH

*Estimate; Year1-4*

| | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | 4Y TOTAL |
|---|---|---|---|---|---|
| **1. Development Coordination** | $0.5-0.7m | $0.5-0.7m | $0.4-0.5m | $0.4-0.5m | $1.8-2.3m |
| **2. Opportunity Development** | $1.1-1.4m | $0.8-1m | $0.7-0.9m | $0.7-0.9m | $3.3-4.3m |
| **3. Opportunity Promotion** | $0.4-0.5m | $1.2-1.6m | $0.6-0.8m | $0.6-0.8m | $2.8-3.6m |
| **TOTAL** | $2.0-2.6m | $2.5-3.3m | $1.7-2.2m | $1.7-2.2m | $7.9-10.3m |

*DIRECT TEAM IMPLEMENTATION COSTS*
*DOES NOT INCLUDE ALL WIDER STRATEGIC ACTIVITIES*
*(See appendix 1 for additional details of those)*

** Assumes some salaries are paid by parent organisations contributing to a "virtual team"; Source: Coriolis analysis*

# *This focused team needs to primarily work on delivering the three transformative Horizon 3 opportunities documented elsewhere*




*These opportunities will not happen with "business as usual"*
*Action is required to catalyse investment and transformation*

*Source: Coriolis analysis*

# *North West Queensland has a clear, proposed agricultural diversification action plan to realise the opportunity*

| | | | | |
|---|---|---|---|---|
| VISION | NORTH WEST QUEENSLAND DEVELOPS A VIBRANT AND ROBUST DIVERSIFIED AGRICULTURE SECTOR, LEADING TO INCREASED PRODUCTION, EMPLOYMENT AND POPULATION IN THE REGION | | | |
| DRIVERS | MODERN | AFRICAN CLIMATE | CLOSE TO MARKETS | SAFE &TRUSTED |
| HORIZONS | HORIZON 1<br>Grow & build cattle | HORIZON 2<br>Support emerging projects & products | HORIZON 3<br>Discover & develop new options | |
| ACTIONS | SUPPORT CATTLE INDUSTRY GROWTH<br>1. Drive on-farm competitiveness<br>2. Enhance supply chain efficiency<br>3. Develop feed grains & fodder crops<br>4. Support regional processing<br>5. Improve regional reputation<br>6. Add value through cattle R&D | SUPPORT INVESTMENT IN WATER PROJECTS<br>1. Leverage existing allocations<br>2. Support project proponents<br>3. Enable landholder development<br>4. Support major infrastructure projects<br>5. Improve processes and systems<br>6. Invest in growth | SUPPORT DIVERSIFICATION INTO NEW CROPS<br>1. Coordinate development<br>2. Develop identified opportunities<br>3. Promote opportunities to attract investment | |

*Source: Coriolis analysis*

# *Five project reports develop the various pieces of the plan*