Developing northern Australia’s agriculture: potential scale, location, benefits and costs

Peter Stone, Cuan Petheram, Ian Watson & Andrew Ash

Contributed presentation at the 60th AARES Annual Conference,
Canberra, ACT, 2-5 February 2016
Developing northern Australia’s agriculture: potential scale, location, benefits and costs

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The north has many development options

- tourism
- mining
- energy
- defence
- cultural & environmental economy
- agriculture
- aquaculture
- others

Potential to unlock value from a wide range of resources for a wide range of purposes
Agricultural development opportunities
The north is already a food bowl
The north’s climate can support virtually all sorts of agriculture & horticulture

<table>
<thead>
<tr>
<th>LAND USE CATEGORY</th>
<th>CROP EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal crop</td>
<td>Maize/corn, millet, oats, rice, sorghum (grain), wheat</td>
</tr>
<tr>
<td>Citrus</td>
<td>Lemon, lime, citrus</td>
</tr>
<tr>
<td>Food legume (pulse crop)</td>
<td>Chickpea, mungbean (black), navy bean, soybean</td>
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<tr>
<td>Forage grazing, hay, silage</td>
<td>Rhodes grass, sorghum (forage), millet, maize (forage), bambatsi</td>
</tr>
<tr>
<td>Forage legume</td>
<td>Lablab, lucerne, cavalcade</td>
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<tr>
<td>Industrial</td>
<td>Coffee, cotton, sugarcane, guar</td>
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<tr>
<td>Intensive horticulture (vegetables)</td>
<td>Capsicum/chilli, cucurbit, eggplant, sweet corn, tomato, melons, pineapple, strawberry</td>
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<tr>
<td>Oilseed crop</td>
<td>Sunflower</td>
</tr>
<tr>
<td>Root crop</td>
<td>Cassava, peanut, sweet potato</td>
</tr>
<tr>
<td>Silviculture (plantation)</td>
<td>African mahogany, Caribbean pine, Indian sandalwood, spotted gum, teak</td>
</tr>
<tr>
<td>Tree crop/ horticulture (fruit)</td>
<td>Avocado, banana, carambola, custard apple, lychee, mango, pineapple</td>
</tr>
<tr>
<td>Tree crop (nuts)</td>
<td>Cashew, macadamia</td>
</tr>
<tr>
<td>Vine</td>
<td>Grape</td>
</tr>
</tbody>
</table>
6.5 Mha soil suitable for perennial production
14 Mha suitable for improved pasture production
16 Mha suitable for irrigated arable production
If we could put all that soil to ‘suitable use’...

- Increase crop by 0.5x
- Irrigation increased 9x
- Mouths fed increased 2.3x
Irrigation is helpful

Georgetown, Qld
Irrigation is helpful

Georgetown, Qld

- increases yield >2x
Irrigation is helpful

• break-even yield 3x

Georgetown, Qld

water is required for the north to reach its potential
Water availability in northern Australia

- Evapo-transpiration (>80%)
- Stream flow (<15%)
- Groundwater (<2%)

2,000,000 GL of rain falls on NA each average year
Rainfall

2,000,000 GL rainfall

100%
Rainfall-streamflow

200,000 GL

stream

flow

10%
Rainfall-streamflow-storage

40,000 GL
dam storage

4%
can store more water, but reliability drops
Rainfall-streamflow-storage-yield

30,000 GL
dam yield

3%
Rainfall-streamflow-storage-yield-loss

15,000 GL delivered

1.5%
Most water can’t be delivered to crops

water sufficient for 0.4% of NA – 10% of suitable soil

200,000,000 ha

1,500,000 ha
If all that water was used for agriculture...

irrigation up 75%  crop up 5%  mouths fed up 13%
Is that a food bowl’s worth?

7.55 million additional mouths

- Perth - x4
- Melbourne & Sydney - 87%
- Asia - 0.2%

65 days of Asia-Pacific population growth
What would that require?

Figure 1-1 Cumulative number of large dams (>10m wall height) in Australia and northern Australia over time since European settlement
What would that require?

90 new dams - cost >$45b
If one’s goals were more modest...

ca 40% of the available area with 20% of the dams
Where could dams be located?

Rainfall reliability an important factor
How might irrigation be distributed?

...but co-location of soil and water also important...
are physical resources enough to secure development?
‘whole of development’ economics have proven challenging
A history of irrigated development attempts

Qld-British Food Corporation (1948)
Territory Rice Limited (1955)
Mareeba-Dimbulah (1958)
Ord River Irrigation Area (1960)
Tipperary Land Corporation (1967)
Lakeland Downs (1968)
Camballin Irrigation Area (1969)
Northern Agricultural Development Corporation (1970)
Burdekin River (1987)
A history of irrigated development success

- Qld-British Food Corporation (1948)
- Territory Rice Limited (1955)
- Mareeba-Dimbulah (1958)
- Ord River Irrigation Area (1960)
- Tipperary Land Corporation (1967)
- Lakeland Downs (1968)
- Camballin Irrigation Area (1969)
- Northern Agricultural Development Corporation (1970)
- Burdekin River (1987)
Anatomy of failure

- natural environment challenging but not main source of failure
- management, planning & finances most important
- overcapitalising early, before lessons learned

impatience costly
Anatomy of success

• climate, soils, farm operations, markets & supply chains viewed as an inter-dependent system

• up-scaling occurs at a considered pace

• allow for lags before investment returns

patience a profitable virtue
Unlocking development in northern Australia

- the basic resource base is plentiful
- the physical environment is challenging but not decisive
- soft and hard infrastructure are limiting; variously shrinking/growing
- investment horizons are extended and less certain

planned and patient capital is key
Thank you

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