Water, environment and sustainable development in northern Western Australia

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Irrigated agriculture as it (almost) is...

East Kimberley
Lake Argyle / Ord Stages 1-2
14 000 plus 7400 ha in progress

West Kimberley (Fitzroy to West Canning)
Fitzroy area - 500 ha
Broome/Canning areas - 1200 ha

Pilbara
De-water… ~860 ha at Marandoo
1200 ha in prep (Nammuldi/Minderoo)

Gascoyne
Carnarvon Irrigation area - 1200 ha
400 ha in progress
So what is proposed...

East Kimberley
- Knox, Keep, Lower Ord… 35,300 ha
- Cockatoo… 18,000 ha

West Kimberley (Fitzroy to West Canning)
- Fitzroy* 110 ha
- Broome* 1380 ha
- West Canning 970 ha

Pilbara
- Pastoral 500 ha
- Mining and related 2840 ha

Gascoyne
- Carnarvon Irrigation area 800 ha

Total approx. 60,000 ha

* West Kimberley – agric. ‘in planning’ maybe adds 5000 to 7000 ha;
So is there enough ‘easy’ water…

East Kimberley – 1145 GL/a (demand building…)
Fitzroy – 200 GL supply excess (spatial gaps, TDS)
Dampier – 50 GL supply excess
La Grange – 50 GL supply excess (fast taking up)
West Canning – 75 GL as above
Pilbara – 200+ GL excess short term, long term??
Carnarvon – <10 GL small potential

Caveats (lots):
…known and new 1600 GL  (includes +4m Ord spillway)
…much of this is not defined or approved
…represents approx. 100,000 ha of potential in NW…
...the quest up north – after water is sorted
Outcome of work: credible science that leads to workable and approved Management Plans
State proponent (eg Goomig)
- Native Title
- Tenure
- Baseline analysis
- Environmental approval (risks analysis & mgt)
- Engineering and construction
- Federal approvals
- State approvals
- Negotiations (all levels)
- Legal
- State paid the big $
- etc

Private proponent (Knox, Stations)
- All tasks of State model
- Major projects via DSD
- Individuals at site scale

Mixed model proponency (La Grange – W Kimberley)
- A mix of the State and private model
- State supporting private development - science
Public led investments…
$320m State
$195m Feds…
...clock ticking..
• Legacy issues
• Base conceptual models and input data*
• Risk analysis
• Impact analysis (management plans)
• Long term monitoring and compliance
• Negotiations (process; UNSW, IRG)
• Conditional approvals - ongoing

* examples of conceptual model issues
• ANZECC baseline – non stationarity (watertables x climate), Keep Rv flow, EC
• Physics of irrigation and salinity risk (clays leak, 2m watertables = salinity?)
• Nutrients – ORIA versus Rangelands
Removed 500ha
Delayed 450ha
Lease 2000ha

Input - $2-3m R4R cash and DAFWA 3000 days time…
Inc Lot size
Saved ~$30m on M2N
Saved $30m on drainage

Developed defensible options & Management Plans for GW & SW & Aquatics

EPBC Conditions – the last over removal of $1m p/a – and Final Approval…!
La Grange – steps
• Baseline data (water, soils, trends)
• Risk management
• Modelling and
• Scenarios

Mosaic of private ventures, or,
Larger investor models?
La Grange –
Baseline data (water, soils, trends)
Risk management
Modelling and Scenarios

Mosaics of private ventures, or
Larger investor models
Using AEM for water & risk assessment

Line 1009801 inversion results

250 km
Using AEM for water & risk assessment

Line 1009801 inversion results

Aquifer system 1

Aquifers 2 and 3?

BME

Wallal

250 km
Local station planning

AEM map of 50m depth – Station X

- Shows variability in salinity of aquifer
- Deeper layers show the Salt Water Interface
- Interpretation gives us aquifer thickness and we are working on watertable and soils information…
Carnarvon (1200 ha)
Better tools...find and manage water & land
Water
- Primary water resource - over 1200 GL is ‘available’
- This water could irrigate >100,000 ha of land
- Secondary sources not accounted

Agriculture in the Environment plus
- Regulators - Environmental (EPA, EPBC), State..
- We have a methodology and checks/balances
- Sustainability - “now” v “future”
- Time/costs - resource assessments…

Royalties providing opportunity to kick off new potential… but its not going to be easy to deliver expectations of limitless land and water… food.
Thank you

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Picture:
(La Grange community engagement; visit DAFWA Web & Facebook)